FARM MEATS

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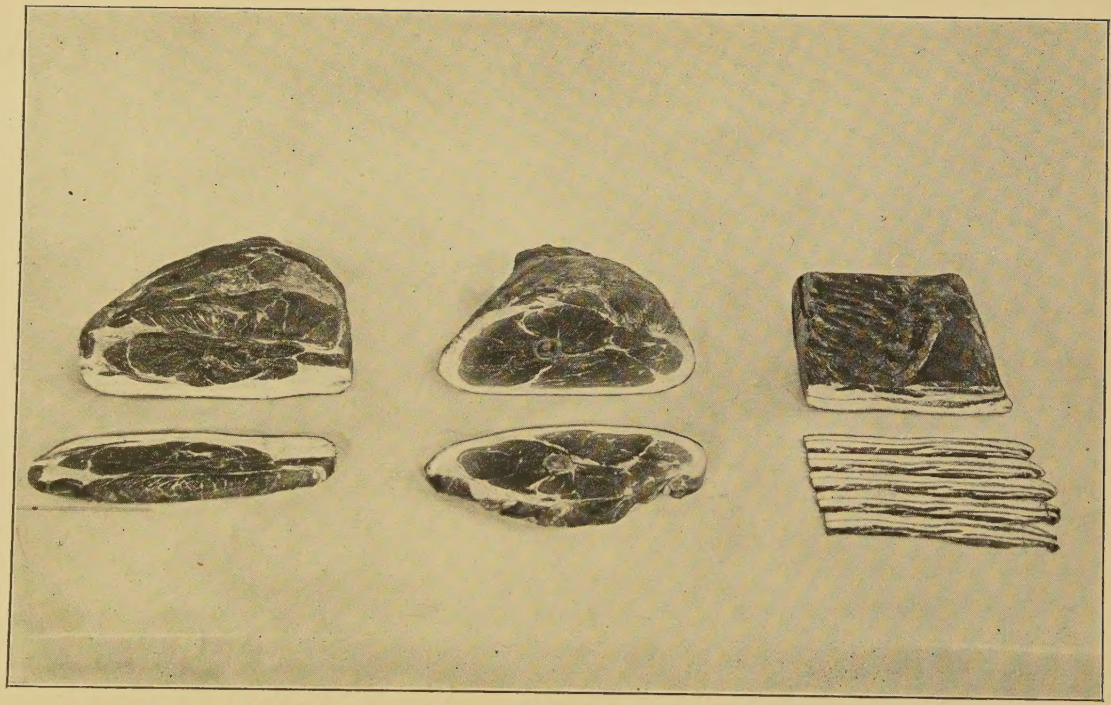

Country cured pork.

FARM MEATS

BY

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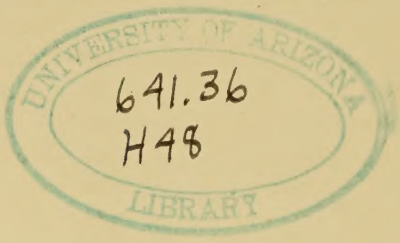

PREFACE

Instruction in Farm Meats is now quite generally recognized as an essential part of the Animal Husbandry and Home Economics courses in the agricultural colleges of the United States. The widespread teaching of Farm Meats is so recent, however, that the scope and material have not been systematized heretofore. The present volume is a complete text-book for such courses, based upon the author's classroom lecture notes revised from year to year, the careful investigation of all the available literature, including books, bulletins, and circulars, and personal experiences and observation on the farm, in the packing house, and in the meat laboratory.

The instruction given in this book has been successfully tested by the author both on the farm and in the laboratory. The treatment is simple and direct, and rendered wholly practical by many important illustrations showing every phase of the actual operations and all the meat cuts. It is therefore intended for the farm and the laboratory as well as the classroom.

The general introduction on the whole topic of Meats should serve to correct many common misimpressions regarding meat as a food. The chapters on Pork have been placed first because the Pork cure carried on in the laboratory can thus be completed before the term is over. Following sections on Beef and Lamb and Mutton, there are miscellaneous topics, with special chapters on curing and tanning hides and on meat rings, concerning which many inquiries come from the farms.

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The author has aimed to give due credit for all data consulted. A list of references is given at the close of each part of the book. Unless otherwise noted, the illustrations were furnished by the Iowa Agricultural Experiment Station, with the kind permission of Dean C. F. Curtiss. The author is deeply indebted to Professors H. H. Kildee and John M. Evvard for encouragement in the preparation of the book; to Mr. John Gosling, a veteran meat specialist of Kansas City, for important suggestions in the preparation of Chapter Seventeen; to Professor Wade Toole, Ontario Agricultural College, for valuable aid in preparing Chapter Fourteen and the work on bacon hogs; to Professor Arthur L. Anderson for constructive criticism of the whole manuscript; to Professors C. W. McDonald and Roy W. Snyder for helpful advice; to Professor H. A. Sandhouse for aid in preparing Chapter Fifteen; and to Mr. E. H. Richardson, Station Photographer, for valuable assistance in the selection and making of photographs. In addition the author acknowledges his obligation to other, unnamed coworkers at the Iowa State College and the Iowa State Experiment Station.

M. D. Helser.

Ames, Iowa,
March, 1923.

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FARM MEATS

FARM MEATS

GENERAL INTRODUCTION

Seventy-five per cent of the meals on the Farm are built up around the meat plate. "Yes, all of the good ones," remarks the Farmer. There is nothing so attractive to the appetite of man as meat. The savory odors in the preparation of meat and its appetizing and satisfying qualities make digestion easy. Hence some form of meat should be served at almost every meal.

From time immemorial meat has been the most important single element in the diet of mankind and it still holds it place today. This is due primarily to the fact that it has most nearly the composition of the body tissues which it is destined to replace.

Proteins are absolutely essential for the growth and maintenance of the body. Meat contains relatively large quantities of protein in its most palatable, stimulating, and digestible form. Generally speaking meat protein has a greater nutritive value than vegetable protein. A constant supply of proteins is needed in the diet for growth, tissue replacement, and stimulation.

Meat also contains fat in a highly digestible form, which yields energy and muscular power, and aids in keeping up the temperature of the body. Fat is a storage product, and energy reserve. In their pure forms animal and vegetable fats have a similar nutritive value, but animal fats on our markets may contain the fat soluble vitamine, which vegetable fats do not.

We also find meat to be rich in nitrogenous extractives, which stimulate the appetite and the process of digestion, and function in various ways. The palatability of meat is due largely to its nitrogenous extractives. Dr. E. B. Forbes of the Institute of American Meat Packers says: "Palatability of food is important, (1) Because it is one of Nature's ways of indicating that food is good to eat, (2) Because it incites the secretion of digestive juices, and so hastens the digestive process, (3) Because it is a source of pleasure in eating, and (4) Because it contributes a deep-seated and powerful motive in human life and action."

Meat is also rich in the necessary minerals, especially phosphorus and iron. Phosphorus is found in every cell in the body and is involved in almost every vital function. The iron in the blood carries oxygen to every part of the body. Without oxygen life cannot go on. Meat also contains some sulphur and other important mineral elements.

Meat is also a valuable source of the much discussed vitamines. Forbes says: "The fat soluble vitamine is present in appreciable amount in lean meat, brain, sweetbreads, and fish roe; it is abundant in liver, kidney, heart, oleomargarine and fat fish. It is exceedingly abundant in cod liver oil. This vitamine may be present in lard if the heat and aeration used in rendering and refining have not been so great as to destroy it.*

"The water soluble vitamine is contained in appreciable amounts in lean meat, kidneys, and heart, and is abundant in liver, brain, sweet-breads and fish roe.

"The anti-scorbutic vitamine is found in lean meat and in liver, in such quantities as to prevent scurvy in case these meats are eaten in liberal amounts."

* Drummond: Oil and Color Trades Journal, March 12, 1921, p. 1054.

Meat is a healthful and desirable food and there is no substitute for meat. During the World War the Government, recognizing the value of meat as a food for fighters, urged its conservation everywhere so that all of our soldiers abroad and those of our allies might be supplied with all the meat they required.

TABLE I

PER CAPITA CONSUMPTION OF MEAT IN THE U. S.

Figures from U. S. Department of Agriculture, as published by National Provisioner, March 4, 1922

Class	*1917*	*1918*	*1919*	*1920*	*1921*
Beef	62.0	64.7	57.2	61.1	57.7
Veal	6.5	7.6	8.2	8.9	8.0
Mutton and Lamb	4.7	4.7	5.8	5.0	6.3
Goat Meat	0.2	0.1	0.1	0.1	....
Pork (excluding lard)	58.4	69.8	67.1	68.9	72.8
Total meat	131.8	146.9	138.4	144.0	144.8
Lard	11.7	14.1	12.4	13.1	11.3
Total meat and lard	143.5	161.0	150.8	157.1	156.1

PART ONE

PORK

PART ONE.—PORK

INTRODUCTION

This country leads the world in pork production. American hams and bacon are rapidly increasing in popularity in a great many of our larger foreign markets.

Pork is the most popular meat in the United States today. Some of the reasons for this are:

1. First class cured pork is easily prepared on the farm.
2. Pork is the most satisfactory meat for curing.
3. Pork is the most satisfactory meat for shipping long distances and for long storage after reaching its destination.
4. There is no other meat from which so many products are manufactured.
5. Hog fat is the most valuable fat produced by any of the meat animals.
6. Pork is the most nutritious meat.
7. The hog yields a greater percentage of edible meat than any other domestic animal.
8. The hog is a very profitable animal to produce.
9. No other animal equals the lard hog in its fat storing tendency.
10. The hog is the most efficient animal for converting grain into meat.
11. Hogs reproduce faster and in greater numbers than any of our other domestic animals.

12. In pork production a rapid turn over is made on the money invested. The hog can be bred to farrow at twelve months of age and then the pigs develop rapidly.
13. Swine production requires only a small investment in animals and equipment.

The home preparation of pork is rapidly becoming more popular on the average American farm. Years ago before the establishment of the modern packing-house the home curing of meat was about the only way to prepare the supply of meat for the year.

Our forefathers were quite adept at this art. Later it seemed easier and better to sell the hogs and buy the prepared products. But during the last two decades the average farmer has felt the desire for the old-fashioned home-cured, hickory-smoked, nut-brown ham and bacon and homemade sausage both fresh and smoked. There is also quite a bit of satisfaction in knowing that the meat has been produced and cured on the home farm.

There is nothing mysterious about curing pork on the farm and any one who can follow the most simple directions can supply himself as well as his neighbor with a strictly high class product.

All instructions found in this text have been tried many times and have proven entirely successful.

CHAPTER I

SELECTION OF HOGS FOR BUTCHERING

Health.—Health is an all-important factor in selecting hogs for butchering. There is always danger of transmitting disease to the consumer of the meat of an unhealthy animal, and the slightest diseased condition will impair the keeping qualities. Be sure that the hogs are healthy regardless of their condition, quality, or age.

Tuberculosis and hog cholera are the two more common diseases of swine.

Tuberculosis is not easily recognized before slaughtering, but it is easily recognized afterward. Tuberculosis is a contagious and infectious disease, affecting body tissue, especially the lymphatic glands and the lungs of both man and domestic animals. If the lymph glands of the neck, liver, lungs, and those along the intestines contain little nodules or pockets of pus, and the spleen, ribs and backbone are infected, the hog has a generalized case of tuberculosis and the meat is unfit for human consumption. It can be used for feed for hogs or chickens after it has been thoroughly sterilized by cooking until all of the meat falls from the bones. When the lesions or pockets are slight and localized in the parts or organs of the body, the affected parts only should be destroyed and the rest is all right. When there is any doubt, it is best to destroy the carcass.

Hog cholera is a highly infectious disease and more

easily recognized before killing, in that the animal shows signs of sickness. Its effect on the glands is hemorrhagic in character. Tiny blood spots appear in the skin, in the glands of the neck and in the internal organs. The kidneys are usually lighter in color, covered with red spots, resembling a turkey egg. The spleen may or may not be affected. The liver may be rather light colored and spotted. The red spots may also appear on the lungs. If the carcass shows any of the above symptoms, it is always advisable to burn the carcass at once, and take no chances.

If a hog recovers from an attack of cholera and has gained in weight for several weeks and appears healthy, it should be all right for food.

Injured animals should be bled and dressed as soon as possible after the injury occurs, otherwise the blood will collect in the injured spot and inflammation will set in. This will cause the meat to sour, either before or during the curing process.

Five days after vaccination, if the hog is doing well, it can be killed for pork and should pass Federal Inspection.

Condition (Fatness).—Hogs should be in medium condition and gaining in weight. Never kill a hog that is losing in weight. The muscles of a thin hog are quite often tough and lack the flavor and juiciness characteristic of the well marbled piece of meat. On the other hand, overfat, oily hogs will not produce high-class cured pork. One of the common faults of country cured pork is that it is too fat. Many farmers think that the fatter the hogs, the better the meat, but this is a mistake. Hogs in medium condition, weighing 200 to 250 pounds, produce the most satisfactory meat for curing on the farm. They produce the handy-sized cuts which will

FIG. 1.—Same type and breed of hogs. Left: Carcass showing too much fat for farm butchering; live weight, 335. Right: Carcass showing right amount of fat; live weight, 220.

cure to the center without getting the outside too salty and strong. (*See* Fig. 1.)

Age.—Hogs may be slaughtered at any age after six weeks. However, the meat from young pigs is watery and lacks the firmness, flavor, and keeping qualities of

the meat from hogs with a little more age. On the other hand, the meat from old hogs is generally tough, coarse, and strong. Hogs from 8 to 10 months old usually give the best results.

Breeding and Type.—The old-fashiond lard hog does not produce the best kind of hams, shoulders, and bacon. They have too great a proportion of fat to lean for the average consumer. The later large type of lard hog is producing far better meat.

Quality.—Smooth, evenly fleshed hogs will produce a finer quality of meat, and will cut up with much less waste than the rough, coarse, wrinkled, flabby individuals. The quality hog will always show more marbling, will dress out a higher per cent of edible meat and will give a more tender, finer-textured product with the right proportion of lean to fat.

Sex.—Boars should never be killed for pork. The meat will have a strong, unpleasant odor and flavor. They should always be castrated and put on full feed until they are entirely healed up and then fed for thirty days. Gilts and sows should never be killed during the heat period. At this time the meat is in sort of an inflamed condition and will not bleed out well. The meat is hard to cure without souring. The pregnant female is all right for pork if she is not too near the farrowing time.

Dressing Per Cent.—One of the very important factors to be considered in the selection of hogs is dressing per cent. By dressing per cent we mean the proportion of chilled dressed carcass to live weight. If a barrow weighed 200 pounds live weight and the dressed carcass weighed 160 pounds the dressing per cent would be 80 or in other words the dressed carcass would weigh 80 per cent of the weight of the live animal. Buyers always

consider dressing per cent when buying meat animals of any kind.

Hogs will dress from 60 to 90 per cent. of the live weight depending upon age, condition, paunchiness or fill, and quality. Hogs from six to twelve months old in high condition usually dress higher than younger hogs in lower condition.

TABLE II

DRESSED YIELDS OF THE PRIZE CARCASSES AT THE 1921 INTERNATIONAL LIVE STOCK EXPOSITION *

Dressed Carcasses weighing 300 pounds and over	
First prize	81.30
Second prize ...	84.54
Third prize	88.00
Dressed Carcasses weighing 200 pounds and under 300 pounds	
First prize	79.32
Second prize ...	78.36
Third prize	79.69
Dressed Carcasses weighing 100 pounds and under 200 pounds	
First prize	75.78
Second prize ...	80.35
Third prize	79.79

TABLE III

DRESSING PERCENTAGES OF THE DIFFERENT MARKET CLASSES OF HOGS †

Hogs	*Live Weight*	*Chilled Dressed Weights.* Head on Leaf Fat in	Head off Leaf Fat out
Prime heavy hogs...	350–400 pounds	82–84%	72–74%
Heavy butchers.....	280–350 pounds	80–82%	72–74%
Medium butchers....	220–280 pounds	78–80%	70–72%
Light butchers.....	180–220 pounds	77–79%	69–71%
Heavy packing.....	300–500 pounds	81–83%	73–75%
Medium packing.....	250–300 pounds	79–80%	71–72%
Light packing.....	200–280 pounds	77–78%	69–70%
Bacon hogs.....	160–220 pounds	76–77%	68–69%
Light mixed.....	150–220 pounds	75–76%	67–68%
Extra light.....	125–150 pounds	74–75%	66–67%
Shipper	100–200 pounds	72–76%	64–68%
Shipper pigs.....	20–100 pounds	62–72%	.....

* Chilled weights dressed shipper style.

† Figures by Wilson and Company in "Pork Production," by Smith.

TABLE IV

FIGURES FURNISHED BY SWIFT AND COMPANY, CHICAGO, AS REPRESENTATIVE OF HOGS OF GOOD AVERAGE QUALITY AS THEY COME TO THEIR PLANT *

Live Weight	*Per Cent of Chilled Carcass to Live Weight Head on, Leaf Fat in*
30–60	60–64 Per cent
125–150	74½ Per cent
150–200	76 Per cent
200–225	78 Per cent
250–300	79½ Per cent
300–400	80 Per cent
400–500	81 Per cent

Selection of the Bacon Hog.—The bacon type of hog is somewhat different from the lard type of hog in form and fleshing. A great deal of the American bacon is produced from the lighter weight lard type of hog. The English bacon is usually supplied by the strictly bacon type of hog.

In form the bacon hog should not be as thick as the lard type but should have a little more length with a smooth even side of good depth and a tapering ham and light shoulder. The neck should be rather short and the head should have light trim jowls. The length of side from tail to shoulder is all-important. Smoothness from one end to the other is very essential.

The bacon hogs must not be in high condition (fatness) but the fleshing should be firm and well filled out and smooth without the assistance of fat. Soft, baggy hams and flabby jowls are very objectionable, because they indicate an uneven distribution of fat and lean in the carcass.

A great deal of the English bacon is supplied in the

* As published in "Pork Production," by Smith.

form of the "Wiltshire Side," which represents half the carcass, minus the head, feet, aitch bone, back bone, breast bone and neck bones. (*See* Fig. 2.)

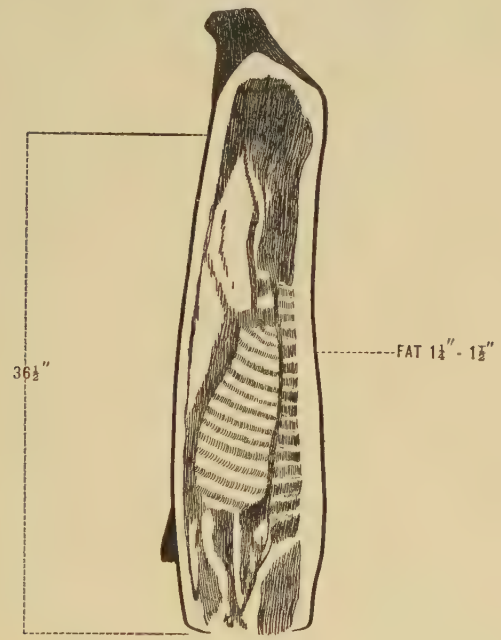

FIG. 2.—Wiltshire side, 45-70 pounds. Best weight, 60 pounds.

What is a Wiltshire Side? *

It is one-half a hog carcass, with the aitch bone, back bone, breast, and neck bone removed, with feet and head off.

* Ontario Boys' and Girls' Pig Clubs, Competition Plans, 1922, as published by the Ontario Department of Agriculture, and Dominion Live Stock Branch.

Requirements of a Wiltshire Side:

Should be from 45 to 70 lbs. in weight: a side weighing 60 lbs. the most in demand. One weighing 60 lbs. should measure 36½ inches from aitch-bone knob to neck, as shown in the illustration. Should be of proper proportions:

I.e.—The shoulder and ham should be equal in weight. Should have proper balance:

I.e.—The belly should be the same thickness as the back fat. Should have proper distribution:

I.e.—The covering of fat on the back should be equal in depth from neck to tail.

Grades of Wiltshire Sides:

(a) LEANEST: Covering of back from 1 inch to 1½ inches in depth.

(b) LEAN: Covering of back fat from 1½ inches to 2 inches in depth.

(c) PRIME: Covering of back fat from 2 inches to 2½ inches in depth.

The Select Bacon Hog:

Jowl and shoulder light and smooth; back, from neck to tail, evenly fleshed; side, long, medium depth, dropping straight from back; ham full, good general finish, no excess fat. WEIGHT, 160-210 lbs. at market.

A hog weighing 200 lbs., the most desirable weight, will make two Wiltshire sides, weighing 60 lbs. each.

Standard Grades of Bacon Hogs

1. SELECT BACON HOGS—Weight 160-210 lbs., jowl and shoulder light and smooth, back from neck to tail evenly fleshed; side long, medium depth, dropping straight from back, ham full, good general finish, no excess fat.

2. THICK SMOOTH HOGS—Weight 160 lbs. to 210 lbs.—not conforming to Wiltshire standard but of smooth fleshing and finish.

3. HEAVIES—Weight 210 lbs-260 lbs., any type of smooth, fleshing and finish.

4. EXTRA HEAVIES—Weight over 260 lbs., any type of smooth fleshing and finish.

5. Shop Hogs—Weight 120-160 lbs., any type of smooth conformation and "finished."

6. Lights and Feeders—Weight 160 lbs. and under. Any type of smooth conformation and "unfinished."

7. Roughs—Of rough conformation, any weight.

8. Sows—All females that have raised one or more litters.
No. 1. Sows of smooth finish and smooth underline up to 350 lbs.
No. 2. All other sows.

9. Stags—Hogs that have been castrated and are well healed.

CHAPTER II

KILLING AND DRESSING HOGS

Management of Hog Before Slaughtering.—Hogs should not be fed for at least 24 hours before killing. They should, however, have plenty of clean water during this time. In the first place this will give the hog a chance to get rid of most of the contents of its stomach and intestines, which is a big help in removing and cleaning these organs. Second, it is easier to get a good bleed when the system is not gorged with food. Third, it is quite a saving of feed. This may seem like a small item for four or five hogs, but with almost 50,000,000 hogs killed annually in the United States it will mean enough corn saved to produce approximately 50,000,000 pounds of pork. Fourth, the meat always cures better when the small blood-vessels are practically free from food products and blood.

Hogs should never be excited or over-heated before killing. This will raise the body temperature above normal and produce a feverish condition, which has a tendency to cause the meat to sour.

Never bruise or whip a hog just before killing; this will not only tend to excite the animal but will cause the blood to collect in the bruised spot. If this happens to be on the ham, shoulder, or bacon, it will have to be trimmed out before going into the cure, otherwise it will sour. If on the fat back, it will have a tendency to darken and lower the quality of lard.

Styles of Dressing Hogs.—There are two principal styles of dressing hogs in the packing houses, the Packer Style and Shipper Style.

Packer Style.—In this style of dressing, the head is removed at the atlas joint but the jowls are allowed to hang on the shoulder. The carcass is split down the center of the back bone. The internal organs or viscera are removed, the leaf fat and kidneys are taken out, and the hams faced. In facing a ham a little strip of the skin and fat is cut off of the face of the ham or the inside of the leg.

Shipper Style.—The viscera is removed and the head is left on, the leaf and kidneys left in, the hams not faced and the hog is not split down the back bone.

Hogs dressed "shipper" style usually dress about eight per cent higher than those dressed "packer style."

Average ham facings weigh ¾ pound, kidneys ½ pound, in 300 pound hogs.

Dressing percentages should always be figured upon the shipper style of dressing so that there would never be any mistake as regards what is meant by dressing percentages. If the packer style is used, it should always be so stated.

Both are given in Table III in order to show the difference.

Tools for Killing and Dressing.—The tools necessary are: A common 6 or 8 inch butcher knife (8 inch is better), a steel, hog hook, hog scraper (a bell-shaped scraper is best but a dull butcher knife or an old corn knife does very well), a hog gambrel, and a kettle for heating water. (*See* Fig. 3.)

Equipment.—For scalding, a small platform or table with a barrel slanted up to one end does very well (a large store box will serve as a platform). This makes a

convenient place to scrape also. After the hogs are all scraped this same table can be scalded and scrubbed thoroughly and used for a cutting table.

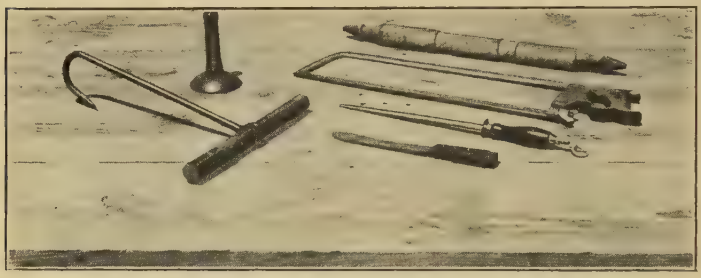

FIG. 3.—Tools necessary for farm butchering.

A post set in the ground with two 4″ x 4″ cross ties will serve to hang eight hogs and even though it is very simple to set up, it is something permanent and will last

FIG. 4.—Complete equipment for farm butchering.

a long time. "Anything worth doing at all is worth doing well." First, be sure that all tools are ready and that there is plenty of hot water. (*See* Fig. 4.)

Methods of Killing.

1. Stunning the hog by hitting in the head, midway between the eyes and ears with an ax or sledge.
2. By shooting through the brain.
3. By bleeding.

All hogs must be bled, whether they have been killed first or not.

FIG. 5.—Sticking hog, showing position when cutting through skin.

Sticking Alive.—When sticking alive, reach under the hog and grasp the legs on the opposite side and pull toward you, turning the hog on its back. One man should stand astride the hog just back of the shoulder and hold to each front foot, holding the hog squarely on its back. Another man should place one hand on the lower jaw of the hog, holding it down, and with the other hand grasp knife, holding edge down toward the neck. Cut through the skin just about 1½ or 2 inches in front of the breast bone. Make the cut just about the width

of the knife. Insert point of knife toward point of breast bone until the bone can be felt. Push knife under point of breast bone just about ¼ inch and then raise handle slightly and push point straight down toward the neck bone of the hog. (*See* Fig. 6.) This will cut the carotid arteries just where they branch between the point

FIG. 6.—Sticking hog, showing position when blood starts.

of the breast bone and back bone. It will also cut the jugular veins.

Be careful not to let the knife go in deeply enough to go through the opening into the chest cavity formed by the ribs on each side; if it does, the chest cavity will be opened and unless the hog is hanging while bleeding, most of the blood will collect in the chest cavity. Be sure that the hog is lying squarely on its back so that the knife goes into the middle of the breast and not into either shoulder as will sometimes happen if the hog is turned a little to one side while he is being stuck. If

the hog is stuck in the shoulder the blood will collect and it will all have to be trimmed out before curing. Blood decomposes very rapidly.

After sticking, the hog may be allowed to go free; if he stands up he will bleed better. When the sticking is done exactly as directed the hog will not walk far. Hogs stuck before being shot or stunned usually bleed better.

Shooting.—Shooting is objectionable because the bullet quite often lodges in the shoulder and may cause the meat to spoil during the cure. However, shooting seems to be about the only way when the hogs are wild and where they are not confined to a small pen.

Stunning.—Stunning with an ax is very inhumane in a great majority of cases. The hog is likely to move his head and cause the ax to fall over either eye, and after one mislick it is very difficult to hit the right place with an ax or hammer and the hog is worried around the pen, excited, will not bleed thoroughly and consequently the meat spoils during or after the curing process. Do not drag the hog to the scalding place until he has had plenty of time to bleed. Dragging will bruise the hog in spots and cause the blood to collect just as in the live hog. This lowers the quality of the meat and lard.

The ideal way to kill hogs is to draw the live hog up by one hind leg with a block and tackle and then stick it. While this is some trouble it will more than pay for the trouble.

Methods of Cleaning the Carcass.

Skinning.—While this is not a common method it is practiced by quite a few people. This requires lots of experience and the average farmer does not care to take the time to learn to skin hogs. The hide is not worth enough to pay for the trouble and the meat is not so well

protected for curing and keeping. This is not a satisfactory method.

Singeing.—The author has heard of cases where farm-

FIG. 7.—Scalding hind end of hog.

ers have tried to singe or burn all of the hair off of the hog. This is not a practical method. Quite often after a hog has been scalded and scraped, he can be singed

with a flame of some kind to get any of the hair which could not be scraped off.

Scalding.—

Water Temperature.—It is all important in scalding that the water be hot. It should have a temperature of about 150°F. for the most satisfactory scald. If possible, use a thermometer; if not, you must depend

Fig. 8.—Cutting out gambrels.

upon your judgment. It is better to have the water for scalding a little too cold than too hot, for the results will be more satisfactory.

Ordinarily when the temperature of the air is between 0° and 15° above zero, add one bucket of cold water to about a half barrel of boiling water. You can also tell when you have about the right temperature by dipping your finger into the water three times in rapid succession. It should burn severely the third time. If it burns severely the first time the water is too hot. A great

many farmers add some wood ashes or some lye or potash to the water.

Steps in Scalding.—Always scald the hind end of

Fig. 9.—Scalding fore end of hog.

the hog first. Insert the hog hook in the lower jaw just under the tongue as shown in Fig. 7. Keep the hog moving around in the barrel so that one part does not lay against the barrel and thus miss scalding with the

remainder of the body. It is not necessary to pull the hog out, except to try the hair, before the hog is scalded and ready to scrape. When the hair slips easily on the hind flank and legs, remove the hog, twist the hair off of the hind legs, cut out the gambrels (*see* Fig. 8), insert the gambrel stick, and proceed to scald the head end as shown in Fig. 9. Part of the hair may be scraped from

FIG. 10.—Scraping hog.

the hind part while scalding the head end. The object of scalding the hind part first is to make sure that the water is not too hot before putting the head in. The head and neck are much harder to clean than the hind part in case the hair happens to set.

Always clean the head and feet first after scalding, because they are the hardest to clean when they cool. The hair always scrapes off more easily if it is scraped the way the hair lies and not against it. (*See* Fig. 10.)

In case the hair cannot be scraped from a part of the

hog, cover that part with some of the loose hair or a piece of burlap and pour on some hot water. It is sometimes necessary to scald all of a large hog in this way.

FIG. 11.—Splitting the pelvic bone.

Hanging Hog.—Hang the hog and rinse off with hot water and scrape with scraper; finish scraping with a knife, and rinse again with cold water, this time scraping up on the hog so that the water may be squeezed out of the pores instead of being forced in. After scraping, if a fancy job of dressing is desired, use a common gasoline blow torch and singe the feet, eyes, ears, and wrinkles, if any, just as with a chicken.

Removing Entrails.—Start the knife exactly in the center between the hind legs and cut into the aitchbone and split the skin down the underline. Open the aitchbone with the knife by feeling for the little ridge underneath, where the bones are joined together. Start the point of the knife into that joint, keeping the knife edge

up. The bone splits quite easily on a young hog and can readily be split on older hogs. (*See* Fig. 11.)

Grasp the bung gut just below the split in the aitch-bone and loosen the tissue toward the bung. Cut around the bung from in front, pushing the handle ahead of the knife blade. It is best either to tie the bung with a string or merely to tie a knot in the gut. Pull the bung out in front of the hog, cutting it loose with a knife where it will not pull loose. Be careful not to pull any of the leaf fat out at this time. Pull the stomach out and cut the esophagus about two or three inches from the stomach and remove all viscera from abdominal cavity. The contents of the abdominal and chest cavities can all be taken out together if the breast bone is split before opening the abdominal cavity. Cut around the diaphragm, allowing all of the muscular portion to remain on the ribs. Split the breast by cutting down toward the cut made in sticking, just a little to the right or left of the breast bone, so that the knife will cut the ribs loose from the breast bone at the point of attachment. Now remove the heart and lungs from the chest cavity. If the head is to be left on the carcass for a short while it is well to remove the tongue at this time also.

Separating the Viscera.—First remove the liver and tear the gall bladder from the liver by running the thumb under the little duct leading to the gall bladder. Tear it loose simply by pulling up, and the bladder will peel out easily. (*See* Fig. 14.) Rinse the liver with cold water and hang it up to cool. Now remove the heart and rinse it in cold water.

Splitting Carcass.—As soon as possible after removing entrails the hog should be split down the center of the backbone to the end of the nose. (*See* Fig. 15.) By

FIG. 12.—Loosening the bung.

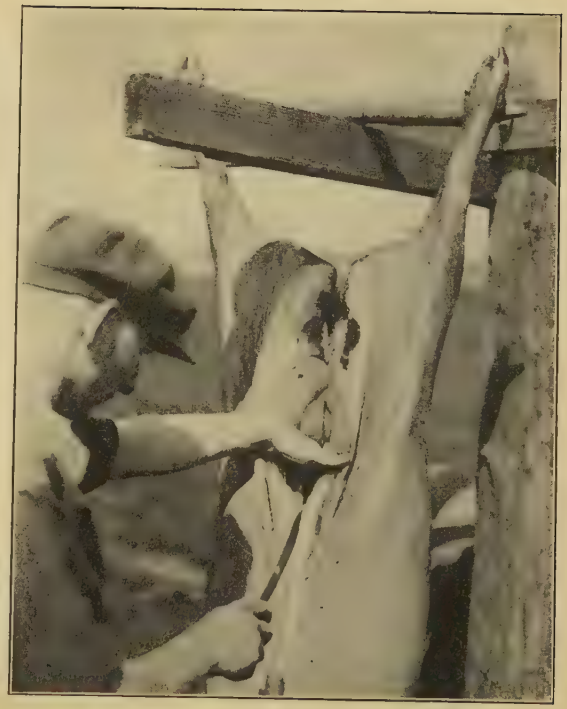

FIG. 13.—Gutting the hog.

splitting down the backbone instead of at either side of it, the whole loin is saved, and can be used for pork chops or roasts, instead of backbone, spare ribs, and loin strip. Too many farmers "hack" the loin all to pieces in trying to chop the hams and the spare ribs loose from the backbone. (*See* Fig. 16.) This is an old method which seems hard to give up. One trial will convince anyone that the other way is the better.

The leaf fat should now be loosened and allowed to hang in the carcass and cool. Start pulling the fat loose from the bottom. The leaf fat can be loosened much more easily when hot than when cold. (*See* Fig. 17.)

FIG. 14.—Tearing gall bladder from liver.

Allow the carcass to hang in this way until thoroughly chilled out. Do not allow the carcass or any part of the meat to freeze. If the carcass freezes a little crust on the outside, not all of the animal heat will escape and this has a tendency to cause the meat to sour when in the cure. A great deal of meat is lost in this way every year.

Handling the Offal.—The liver can either be fresh fried, used for liver sausage, or boiled for scrapple or head cheese. The heart can be pickled or used for sausage or scrapple. The caul fat which sur-

FIG. 15.—Splitting the hog.

FIG. 16.—The old-fashioned way of chopping ribs loose from backbone.

rounds the stomach and the ruffle fat which surrounds the small intestine can be used for a cheap grade of lard. It can be mixed with the back and leaf fat for lard but quite often gives a bad flavor. It is best to use all of the gut fat for soap.

In removing the ruffle fat, start at the stomach (*see* Fig. 18), and tear the fat from the intestine without the use of a knife, then tear the entire ruffle of fat out.

FIG. 17.—Loosening the leaf fat while warm

The stomach, small intestine, and bladder should be thoroughly scraped and cleaned for sausage casings. The large intestine or black gut can be thoroughly cleaned and pickled for pork chitterlings. The lungs, spleen, and kidneys and what is left of the head should be cooked up for chicken feed.

Dressing Pigs for Roast Pig.—Use a small fat pig weighing anywhere from 25 to 75 pounds and dress the same as any other hog except that the head should not

be removed and the backbone should not be split. The head and feet should be cleaned especially well and then singed.

Judging Hog Carcasses.—Very few of the hogs slaughtered in the larger packing-houses are sold as whole carcasses. A large per cent of the hog carcass is marketed as lard and cured meats, very little as fresh pork.

Factors in Judging.—The factors to be considered in judging and grading hog carcasses are, type, shape, finish, quality and weight.

Fig. 18.—Removing fat from intestines.

Type. — The type of the carcass usually decides how it is to be cut and what kind of trade it is to supply. Lighter hogs in medium condition with smooth sides are commonly used as bacon hogs. For ideal bacon the side should be long, wide, of medium thickness, and neat along the underline.

Shape or Form.—The shape of the ideal lard hog is a little different from that of the bacon hog. Wide backs, deep sides with plenty of length are desired. The heavy shoulder is objectionable as this is very cheap meat. A neat underline also insures the least possible trimming for cheap meat and lard.

Finish.—Finish in the dressed carcass corresponds to

condition in the live hog. This is indicated by the depth of the fat covering along the back and sides; also by the amount of leaf fat. The leaf fat lines the abdominal wall and envelops the kidneys. Highly finished hogs will dress a high per cent of carcass to live weight and yield a much higher per cent of lard. The hog carcass with a medium finish is the most desirable now. The heavy lard yield is not so desirable as it was a few years ago.

Quality.—Quality is indicated by firm, bright, smooth grained (fine fiber) lean; and also by firm white fat evenly distributed over a smooth carcass, free from wrinkles, lumps or coarseness of any kind. Medium fine bone indicates a carcass that will cut a high per cent of meat to bone.

Weight.—Weight is a very important factor. The heavier hogs usually get into the packer class. The medium weight carcasses are the most desirable. The lighter hogs are usually sold as shippers or pigs.

Classification of Carcasses.

TABLE V

CLASSIFICATION OF HOG CARCASSES ON THE CHICAGO MARKET BASED UPON THEIR USE *

	Carcass weights
Smooth Heavy or Heavy Loin Carcasses	240–400
Butcher or Light Loin Carcasses	160–240
Packing Carcasses	100–400
Bacon Carcasses	90–170
Shippers	100–200
Pigs	20–100

Smooth Heavy or Heavy Loin Carcasses.—This class refers to prime hogs, either barrows or good clear (not seedy) sows weighing 240 to 400. The fat should be four to six inches deep. The carcass must be smooth, free from flabbiness, with white firm fat and bright colored

* Illinois Bulletin 147.

lean. The heavy loin is the principal cut. The hams are usually skinned.

Butcher or Light Loin Carcasses.—Those suitable for family trade, either as fresh pork or as cured cuts. The same shape and quality as the heavy loin carcass should be shown here, but without the high condition. This carcass is cut in the regular style or it may be sold without cutting, to the retail market for fresh meat trade.

Packing Hog Carcasses.—A great many of the hogs get into this class. The weight and condition may vary considerably. They are usually coarse in quality and uneven in finish; and not suitable for the ordinary fresh cut trade or for smoked meat. They are usually packed in the form of mess pork and dry salt meats. The heavier hogs in this class are usually made up of rough seedy sows, coarse barrows, and stags. The skin of these hogs is quite often thick, wrinkled, and dark colored. The meat is coarse grained, the fat soft and oily, and the bones heavy.

Bacon Carcasses.—Such carcasses are long and smooth with deep sides. A uniform layer of fat covers the entire carcass. A high proportion of lean to fat in the sides is very desirable. The hams and shoulders are usually light. The flesh and fat must be firm, bright colored. The best bacon hogs should have between one and one-fourth and two inches of fat. It should not vary over one-fourth of an inch at different points on the back and shoulders.

Shippers.—Similar to butcher hog carcasses in shape and finish, but lighter in weight. They do not have the long sides found in the bacon carcass of the same shape and finish. Used mostly for retail trade as fresh meat, therefore they must be of good quality. A great many of this class are sold in the whole carcass.

Pigs.—Carcasses from lean, young hogs of poor quality and shape. Used in small retail markets for cheap trade. Roasting pigs are quite often suckling pigs dressed with head on for roasting whole. The carcasses should weigh from 15 to 25 pounds.

Score Cards.

IOWA STATE COLLEGE
DEPARTMENT OF ANIMAL HUSBANDRY
Meat Laboratory
Students' Score Card

LARD HOG CARCASS

	Scale of Points	*Perfect Score*
1.	AGE—Six to ten months, reddish colored bone	5
2.	WEIGHT—150 to 200 pound carcass	10
3.	SHAPE OR FORM—Wide back and loin, long deep sides, well filled hams and shoulders, neat jowl trim underline	15
4.	FINISH—Medium depth, even, firm covering of white fat, free from blood spots. Oily, soft, flabby fat is objectionable. Should not be over fat nor lack fat covering	25
5.	QUALITY—Head medium size, shanks fine, body free from wrinkles or bunches. Flesh firm, bright and smooth grained, well marbled, high proportion of lean to fat, heavy shoulders are objectionable. Indications of stagginess or seedy sows are discriminated against	20
6.	FLAVOR AND TENDERNESS—Not too old or too young, well marbled. Minimum amount of connective tissue or gristle	15
7.	SOUNDNESS—Free from bruises, boils and cuts. Should be odorless and uniformly colored. Should be well cleaned	10
	TOTAL	100

Name ..... Date .....

IOWA STATE COLLEGE
DEPARTMENT OF ANIMAL HUSBANDRY
Meat Laboratory
Students' Score Card

BACON HOG CARCASS

	Scale of Points	*Perfect Score*
1.	AGE—Six to ten months, reddish colored bone	5
2.	WEIGHT—130 to 160 pounds	10
3.	SHAPE OR FORM—Long deep sides, well proportioned. Well filled tapering hams, neat shoulder and light jowl. Trim underline	20
4.	FINISH—Evenly fleshed, uniform depth of fat from shoulder to ham. Layer of fat on back and belly should be 1¼ inches thick	20
5.	QUALITY—Head of medium length, fine bone, smooth skin and covering, free from wrinkles or bunches. Flesh firm, bright and smooth grained, well marbled, high proportion of lean to fat. Roughness is discriminated against. Indications of staginess or seedy sows are discriminated against	20
6.	FLAVOR AND TENDERNESS—Not too old or too young, well marbled. Minimum amount of connective tissue or gristle	15
7.	SOUNDNESS—Free from bruises, boils and cuts. Should be odorless and uniformly colored. Should be well cleaned	10
	TOTAL	100

Name ..... Date .....

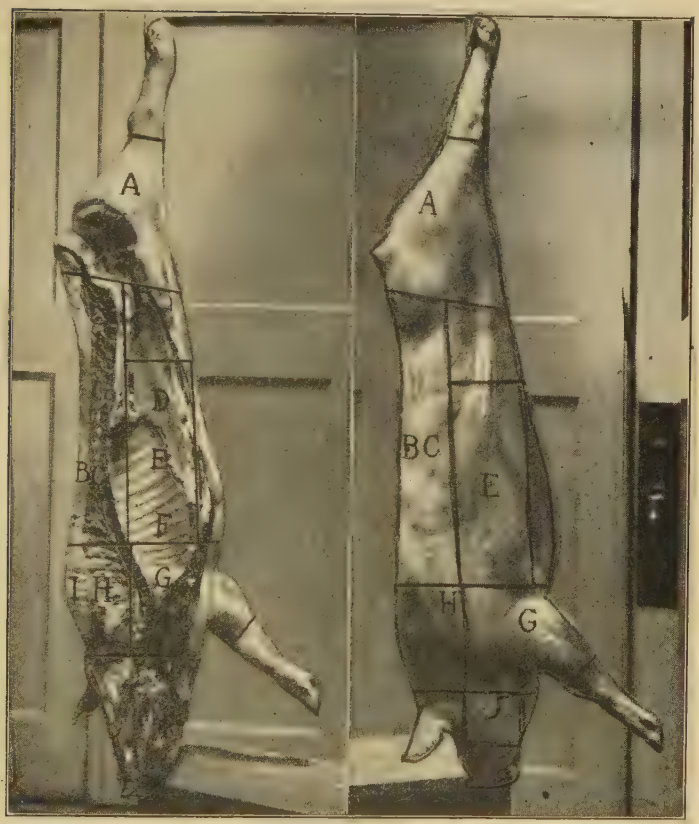

FIG. 19.—Location of cuts of pork. A, ham; B, fat back; C, loin; B and C, back; D, leaf fat; E, bacon; F, spare ribs; D, E, and F, belly; G, shoulder; H, Boston butt; I, clear plate; H and I, shoulder butt; J, jowl.

CHAPTER III

CUTTING AND CURING PORK

A handy bench for cutting the carcass can be made by using two ordinary planks with a strong barrel under each end.

A carcass should not be cut up until it has thoroughly cooled. It is difficult to make smooth, even cuts on soft pork. Lay a half carcass on the table, bone side up.

FIG. 20.—Removing head at first or Atlas joint.

Division of Carcass.—The carcass is divided into four main parts: the head, shoulder, middle, and ham. (*See* Fig. 19.)

Head.—If the head has not been removed before, it should be cut off at the atlas joint (where the neck bones join the skull), and trimmed as follows: Lay head with neck end down, and cut jowls off. Trim them up

squarely and put them in the cure with the rest of the meat, and in one week they will be cured into excellent jowl bacon or pickled pork.

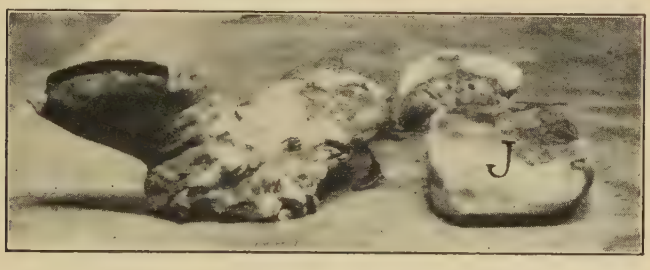

FIG. 21.—Showing head and jowl trimmed.

Trim off all of the meat from the head and use for scrapple or head cheese. Remove tongue and use for scrapple or pickled tongue. Remove brain, which may be fresh fried or scrambled with eggs.

FIG. 22.—Removing shoulder across third rib.

Shoulder.—Cut the shoulder off across the third rib. (*See* Fig. 22.) Be careful in removing the neck bones and end of spare ribs not to let the point of the knife run too deeply into the shoulder, or too much of the meat

will have to be trimmed away in order to make a smooth cut. The shoulder can then be trimmed as nearly like a ham as possible and cured in that way if desired. The best way, however, especially with a large shoulder, is to cut the shoulder butt or top of the shoulder off, beginning at the point where the neck bone came out (*see* Fig. 23), and cutting on a line parallel with the top of

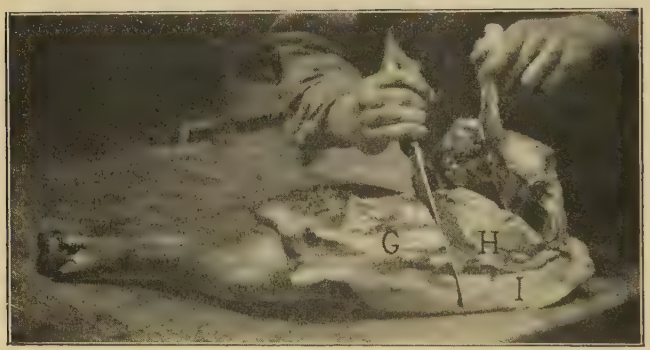

FIG. 23.—Lifting the neck bones or bloody end of the spare ribs and separating shoulder butt from shoulder. G, shoulder; H, Boston butt; I, clear plate.

the shoulder. The fat can be trimmed from this shoulder butt in one piece. It is called the clear plate. It can be rendered into lard or it can be cured for salt pork with the rest of the meat and used for seasoning in cooking. The lean portion left, known as the Boston Butt, makes an excellent roast when used fresh, or it can be rubbed with salt and allowed to lay about five days and then given a light smoke. Smoked butts are becoming more popular all the time. It can also be used for sausage. It can also be sliced into chops and fried down or canned. (*See* Fig. 24.) Then trim off the corners of the shoulders and any wrinkles at the top of the shank. This is known

as a picnic shoulder. It is sometimes called a California ham or cala. Ordinarily a much more satisfactory cure can be obtained by removing the Boston Butt. When it

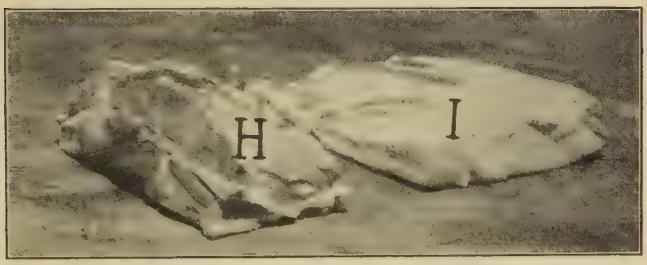

FIG. 24.—Shoulder butt trimmed into Boston butt and clear plate. H, Boston butt; I, clear plate.

is left on, the shoulder must remain in the cure for such a long time in order properly to cure the portion between the skin and the shoulder blade, that the rest becomes too

FIG. 25.—Shoulder or picnic trimmed.

salty. If the carcass is from a hog weighing over four hundred pounds, the skin and part of the fat should be trimmed from the outside of the shoulder. This enables the cure to penetrate more easily, and lessens the danger

of souring. Be careful not to expose the lean because the salt in the cure will harden it. Cut the foot off just above the knee at right angles to the shank and not at right angles to the shoulder itself. The foot can be cleaned and cooked for head cheese, souse, or pickled pigs' feet.

Fig. 26.—Removing ham at right angles to hind shank.

Ham. — Remove the ham by sawing on a line from a point between the fourth and fifth bones (counting toward the tail from the point where the backbone rises toward the tail) through a point about two inches in front of the point of the aitch or pelvic bone. (*See* Fig. 26.) If the hog weighs less than two hundred and twenty-five pounds, the ham can be cut a little longer, but if the hog weighs over three hundred the cut should be made up close to the pelvic bone to insure a satisfactory cure. Always make this cut at right angles to the shank. To trim the ham, slip the knife under the tail bone and cut it out. Then with the shank in one hand, hold the ham, shank end up, with the bone side or face, toward you, trim off the fat on the back edge, or cushion side of the ham, in one smooth cut if possible. Then trim the fat from the face

and flank side. Trim off all ragged pieces and rough edges, but expose as little of the lean meat as possible because the salt will harden it. (*See* Fig. 27.) If the hog weighs over four hundred, the ham should be skinned, leaving an even layer of fat about one-half inch thick covering the lean.

Middle.—The back and belly should be separated by cutting from a point just at the lower edge of the little

FIG. 27.—Ham partially trimmed.

tenderloin muscle, where the ham was cut off, to a point at the lower edge of the backbone at the shoulder end. (*See* Fig. 28.) Remove the layer of fat or fat back from the loin and use it for lard. (*See* Fig. 29.) The loin can be used for roasting or sliced into chops and used fresh or fried down. (*See* Fig. 30.) Trim the spare ribs from the belly, being careful to keep the point of the knife against the bone all the time so that it will not cut into the bacon. (*See* Fig. 31.) Square up the edges of the side and use for bacon. (*See* Fig. 32.)

All trimmings should be used for sausage. All of the meat to be used fresh which is not to be used for a day or two should be frozen or slightly salted.

Essentials in the Selection of Pork Cuts.—The edible portions of the various cuts of pork are all about equal in digestibility and when the fat is trimmed off in the regular way they are about equal in their nutritive value.

FIG. 28.—Separating middle piece or rough short ribs into back and belly. Back—B, fat back; C, loin. Belly—E, bacon; F, spare ribs.

The consumer in selecting what cuts of pork are to be used should consider palatability and economy in addition to the points mentioned in judging carcasses.

Palatability. — In order to be palatable, the pork cuts must be tender, juicy, sweet, well flavored, and sound.

Tenderness.—Pork can be judged by the texture of the lean; the fibers should be fine and as free from connective tissue and gristle as possible. The meat should be somewhat firm and have a smooth velvety appearance. Always avoid the cuts with a stringy appearance. The lean should be well mixed with small fat particles and not have large gobs of fat here and there in the cut. The bone is also a fairly good indication of the tenderness of the meat. Reddish colored bone indicates that the meat comes from a young animal and the meat from young animals is usually tender.

The location of the cut has considerable influence on the tenderness also. The walls of the muscle fibers be-

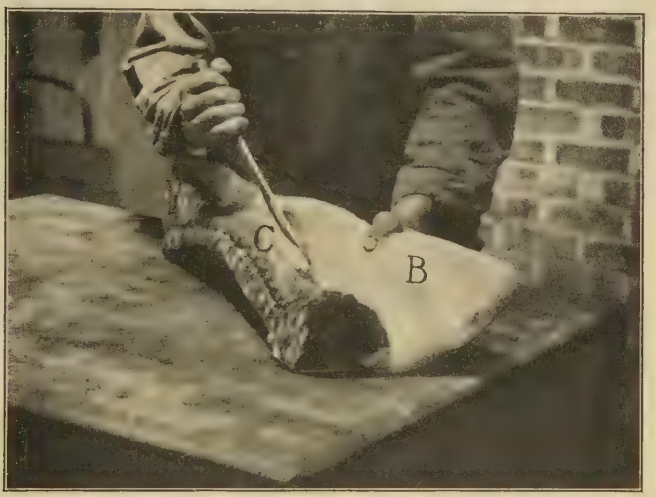

FIG. 29.—Separating back into loin and fat back. B, fat back; C, loin.

come hard and tough in the parts of the body where there has been much muscular action such as in the neck and shanks. The muscle fibers are tender in young animals

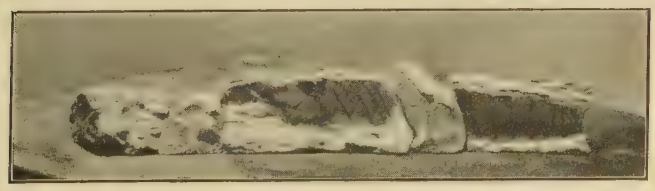

FIG. 30.—Pork loin showing typical loin and rib chops.

and in those parts of older animals in which there has been little muscular strain. The loin muscles extending along the backbone are considered the most tender cuts.

FIG. 31.—Removing spare ribs from belly. F, spare ribs; E, bacon.

Juiciness.—Tender pork with the proper mixture of fat and lean is juicy. Very young watery pork is not

FIG. 32.—Belly trimmed into spare ribs, bacon strip and flank end. E, bacon; F, spare ribs.

juicy. The juiciness must come from the muscle fibers which should be rich in liquid extractives. These extractives have very little nutritive value, but they do

increase the palatability and stimulate the flow of the digestive juices.

Sweetness, Soundness, and Flavor.—These three qualities are very closely associated. Sound fresh pork is practically odorless, and all fresh pork from healthy, well fed animals should be sound. Fresh pork will absorb flavors readily so that great care should be taken as to how the pork is handled from the time the animal is slaughtered until it is ready for the table. Poor refrigeration facilities quite often cause unpleasant flavors and a distinct odor. The pork should be free from bloody spots and have a bright color or it may have a sour odor and flavor.

Palatability may be influenced considerably in the process of cooking. The best of pork will have a poor flavor if not properly cooked. High seasoning during the cooking process should not be necessary in order to get a palatable product.

Economy.—The economy of the various pork cuts depends to a great extent on the proportion of fat, lean, and bone. It also depends to some extent on the cost of preparation and the quantity required to satisfy the consumer.

TABLE VI

Composition of Pork Cuts *

	Refuse	*Water*	*Protein*	*Fat*
Loin	19.3	40.8	13.2	26
Bacon Strip	6.2	29.5	6.5	56.6
Shoulder	12.4	44.9	12.0	29.8
Ham	10.3	45.1	14.3	29.7
Pig Feet	74.1	14.3	4.1	6.9
CURED AND SMOKED MEATS				
Ham	12.2	35.8	14.5	33.2
Shoulder	18.9	30.7	12.6	33.0
Bacon	8.7	18.4	9.5	59.0

* Farmers' Bulletin 34.

TABLE VII

PORK-CUTTING PERCENTAGES

Average for hogs weighing about 225 pounds. Figures from records of Animal Husbandry Meat Laboratory, Iowa State College.

Live weight	233
Live weight after 24 hours' shrink	225
Per cent of chilled dressed weight	81.77%

Wholesale Cut	*Weights of Cuts*	*Per cent of Live Weight*	*Wholesale Price per Pound —Cents*	*Total Value of Cut*
Hams	31	13.77	22	6.82
Shoulders (Picnic)	19	8.44	13	2.47
Boston Butts	8	3.55	14	1.12
Loin	26	11.55	17	4.42
Fat Back	28	12.44	8	2.24
Bacon	27	12.00	22	5.94
Spare Ribs	3	1.33	6	.18
Leaf Fat	8	3.55	12	.96
Head	11	4.93	4	.44
Cutting Fat	14	6.22	10	1.40
Miscellaneous	4	1.77	5	.20
Sausage Meat	5	2.22	12	.60
	184	81.77		26.51
Total fat used for lard	50	22.22		
Total weight of rendered lard	37.50	16.66		

NOTE:—Miscellaneous includes feet, tail, and neckbone. Cutting fat includes fat trimmings from ham, flank end of bacon, and other cuts. Fat used for lard includes fat back, leaf fat, and cutting fat.

There is not much variation in the wholesale price of the various cuts of pork. The ham is the most valuable part of the hog, with the bacon and loin following quite closely.

Curing Pork.

Vessels for Curing.—Oak barrels or large stone jars are the most satisfactory vessels for curing. A round

cement vat such as the one shown elsewhere in this text in the plan for the Iowa Exp. Sta. Smoke House is quite satisfactory. The stone jars are somewhat expensive and apt to be broken, but are quite easily kept clean. If meat spoils in them, they can easily be cleaned and used again. A clean container is absolutely essential for successful meat curing. Vessels should always be thoroughly scalded out before being used. Do not take any chances with the curing vessel, as a great deal of meat is spoiled in this way every year.

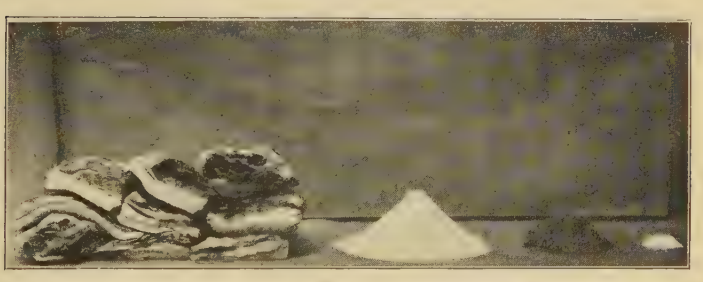

FIG. 33.—Ingredients for the brine cure: 100 lb. meat; 12 lb. salt; 3 lb. sugar; 2 oz. saltpeter, dissolved in 6 gallons of water.

Methods of Curing Meat.—There are many methods of curing meat, most of which are simply a variation of two principal methods, the brine cure and the dry salt cure.

Curing Agents.—Common salt is the basis of all meat curing. It has a preserving effect and has a tendency to make the tissues hard and dry by driving out the moisture and meat juices. Sugar is sometimes used to give a sweet flavor and it aids in counteracting the action of the salt by keeping the muscles soft. (*See* Fig. 33.) Brown or white sugar may be used; the old fashioned brown sugar usually gives a little better flavor. Syrup may be used in place of sugar. Saltpeter (Potas-

sium Nitrate) may be added to give a red color and it also has some preserving effect. Sodium Nitrate (Chili Saltpeter) may be used in place of the potassium nitrate. Use about ⅕ less Sodium Nitrate than Potassium Nitrate. Without the use of saltpeter the meat will be gray in color when it comes out of the cure. The red color is made by the formation of nitrous acid which acts on the hemoglobin, producing a bright red derivative (hemorrhoidin). Baking soda is quite often added to the brine cure to keep it from souring. Other ingredients are sometimes added for flavoring. Salt, sugar, and saltpeter makes the best combination for curing meat. Common salt, however, is the only absolutely necessary ingredient. An excellent product can be made with salt alone.

In all cures be absolutely sure that the meat has all of the animal heat out of it and that it has not been frozen. A great deal of meat is lost every year by allowing the meat to freeze before curing or during the curing process.

Place for Curing.—A cool, well ventilated cellar is a very desirable place for both brine and dry curing. The smoke house is quite often used for curing as well as smoking. Cold storage rooms make the best place for curing meat; here a uniform temperature may be maintained and there will be no doubt about the meat spoiling in the center before the salt works in, and no danger of the meat freezing.

Either the brine cure or the dry cure will produce a first-class product. The beginner usually obtains a more uniform cure with the brine method. This method is not so satisfactory in warm weather or when the temperature ranges above 40° F. The brine will sour and the meat will spoil. Splendid results may be obtained with

the dry cure if you are careful to get the cure rubbed on evenly.

The Brine Cure.—If sugar is added, this cure is known as the "sugar cure" or "sweet pickle."

For each 100 pounds of meat use

12 lbs. salt
3 lbs. sugar
2 ozs. saltpeter
6 gals. water

Thoroughly mix the salt, pulverized saltpeter, and sugar (either brown or white, brown preferred) and rub some of the mixture into the hams, shoulders, and bacon. (*See* Fig. 34.) Pack all meat, ham, shoulders, bacon and jowls in the same vessel. Put the skin side down on all but the top layer; there put skin side up. Weight this down with hard burned tile or brick or some hardwood. Never use pine wood or limestone. Be sure to weight this down before pouring the brine in, because some of the meat will float.

Boil the six gallons of water to make sure that it is absolutely pure. While the water is still warm, dissolve the ingredients left after rubbing the meat. After the brine has cooled, pour it over the meat. Be sure that all the meat is completely covered with brine. Set aside in a cool, well ventilated place to cure about three days per pound for each piece of ham and shoulder. Two days per pound is sufficient for the bacon. Hams and shoulders weighing twenty pounds or more should be cured three days per pound per piece. Pieces weighing over twenty pounds should be skinned or trimmed down to at least twenty pounds in order to obtain a satisfactory cure. Bacon weighing around ten pounds will cure in about two to three weeks; the jowls will cure in one week. In order to insure a uniform cure, the meat

FIG. 34.—Showing method of rubbing the salt, sugar, and saltpeter into the ham.

should be repacked in seven days, leaving out the small pieces such as the jowls. (*See* Fig. 35.) After the meat has been weighted down, pour the brine over the meat unless the brine is sour and ropy. Sour brine should be

thoroughly boiled and some soda added before using it again. It is safer to make new brine, scald the barrel thoroughly, and wash the meat thoroughly. In case a new brine is made, do not make it quite as strong as the first, and do not leave the meat in quite so long as would have been done with the first brine. The brine should be carefully watched for souring and ropiness.

FIG. 35.—Overhauling or repacking the meat. Showing vessels for curing.

The meat should be repacked again on the twenty-first day of the cure, and the bacon removed. When the meat comes out of the cure, wash thoroughly in hot water to get the grease off of the rind, then wash in cold water, and hang in smoke house to drip about twenty-four hours before smoking.

The Dry Cure.—Here again salt is the basis, but any of the other ingredients may be used if a sweet flavor and a red color are desired.

For every 100 lbs. of meat use:

8 lbs. of salt
3 ozs. saltpeter
3 lbs. sugar (Brown preferred)

Mix the ingredients thoroughly and rub half of the mixture on the meat. If the weather is above 45° F. it is advisable to push some of the salt up along the shank bone and some into the hip joint where the ham has been cut from the side. This will get some salt to the inside of the ham before it has a chance to spoil. Many people think that as soon as the outside of the ham is salted, it is safe, but the inside must keep until the salt has had a chance to work in. In seven days rub the other half of the mixture on the meat. The small pieces may be left out this time. Repack again on the twenty-first day of the cure and remove bacon. There will be some liquid in the bottom of the vessel. The meat from the top of the pack should be placed on the bottom and vice versa, this time to get a uniform cure. Three days per pound per piece will be sufficient for the hams and shoulders. Wash the meat with cold water and hang in the smoke house to drip for twenty-four hours before smoking. Be sure to hang the pieces so that they do not touch each other.

If you expect to use the meat from either of the above cures before the weather gets warm or within 30 or 40 days after curing it may be taken out of the cure in a little less than 3 days per pound per piece. If you expect the meat to keep during the hot summer months, three days per pound per piece will not be too much.

All other methods of curing are simply a variation of one of the above methods.

Sour Hams.—The souring of hams usually develops during the first four weeks of the cure and can be de-

tected by the sour odor. It usually begins at the "stifle" joint and works toward the center of the ham along the bone.

According to McBryde,* ham souring is caused by the introduction of the ham-souring bacillus (B putrefaciens) into the body of the ham. This may be introduced through the brine or by means of a thermometer, hook, knife, or steel pushed into the body of the ham. Neither salt nor saltpeter destroys this bacillus, but they do inhibit the growth and development to a marked extent.

Sour hams can never be restored to a sound condition on account of the chemical changes which have taken place. In other words, putrefaction has set in. If the souring is detected at first, the hams can be boned out, parboiled, and roasted or boiled. With a little seasoning it will be difficult to detect any sour odor or flavor.

If not too far advanced, this meat can be canned by the cold pack method and kept as well as any other meat.

Some Precautions to Prevent Ham Souring.

Be sure to bleed the animal thoroughly.
Do not overheat the animal before killing.
Have all animal heat out of meat before curing.
Use pure salt, sugar, and saltpeter.
Boil the water for the brine or pickle.
Scald out all curing vessels.
Do not punch steels or other sharp instruments into the ham.
Rub each piece with salt before packing for cure.
Cure in a cool dry place. Examine brine every few days for souring.

* A Bacteriological Study of Ham Souring, Bulletin 132, B. A. I.—U. S. Department of Agriculture.

Boiled Ham.—The hams may be boned and cooked after coming out of the pickle without being smoked.

Lay the ham on the meat side with the shank away from you, cut around under the skin and loosen from the top of the shank, strip the skin back over the shank and cut out the hock bones. Trim the fat from the flank side down to the skin. Now cut around the inside edge of the pelvic or aitchbone and then around outside until bone comes out. Loosen the meat around the head of the center bone, and cut the meat loose as far as possible in toward the stifle joint. Open the meat from shank to knee joint and cut out the shank bone. Then grasp the loose end of center bone with one hand and cut around the stifle end, twisting the bone until it comes out. Be sure to get the small knuckle bone at stifle joint.

Turn the ham skin side up, peel the hide loose around butt end. Cut a hole in the skin large enough for your finger to pass through. Hold the skin up and cut loose down to the shank, leaving no fat on skin if possible. Now trim all of the fat from the ham except a layer about ½ to ⅝ inch in thickness. Put the skin back over the ham, turn the ham skin side down, and place the shank skin back in place. Wrap the ham tightly with a strong string. It may or may not be smoked at this point.

Wrap in canvas or heavy clean cloth and cook in water.

CHAPTER IV

SMOKING MEAT AND RENDERING LARD

Smoking helps to preserve the meat by forming a coat of creosote over the outside of the meat; this aids in keeping the insects away and keeps the meat from drying out so much. It also adds to the flavor.

Methods.—Any small tight building will be satisfactory for smoking meat. Hang the meat 6 or 8 feet away from the fire if possible. A very satisfactory smoke house is made of hollow tile with a cement floor and roof as shown in Fig. 36. With a cement floor the fire can be built on the floor. Portable smoke houses are also giving satisfaction. There are several on the market at the present time.

Where there is only a small amount of meat to smoke, the following method will give satisfaction: Dig a hole about two feet deep. Lay a tile from a point about a foot from the bottom of this hole to a point about 4 to 6 feet away, then bring the tile to the top of the ground. Knock both ends out of a barrel and set it over the end of the tile. Lay a couple of strong sticks across the top of the barrel to hang the meat on, and then cover as tight as possible. Build a fire in the hole and cover it tight, thus allowing the smoke to pass through the tile into the barrel. Build a little fire each morning for about a week. If a building with a wooden floor is used for a smoke house, the fire should be built in an iron kettle which is placed on a couple of flat rocks. During the winter months, the fire should be kept

going continually until the meat is smoked, maintaining a uniform temperature. This will require about thirty hours to finish one lot of meat. During the spring

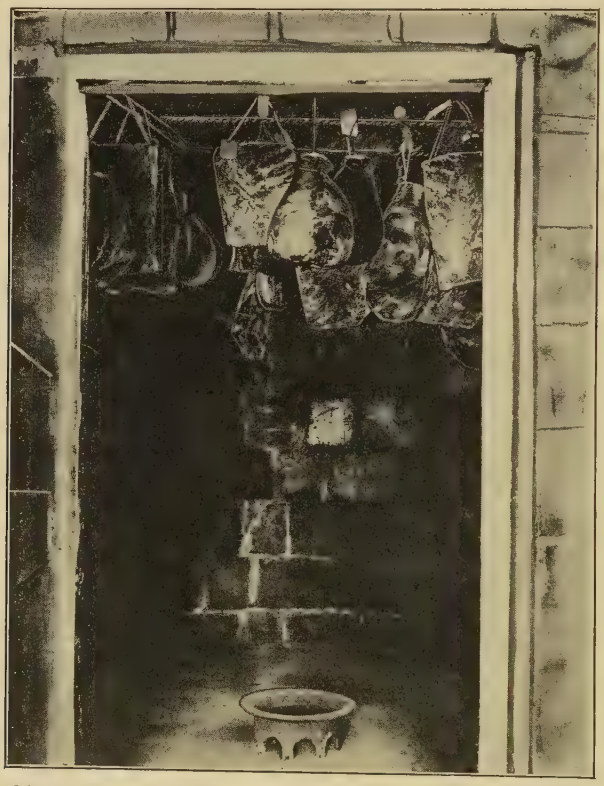

FIG. 36.—Iowa Experiment Station smoke house filled with meat.

month a small fire should be kindled each morning until you get the desired color. Build small fires but always have a blaze if possible; it will give a brighter color to the meat and will not give it a smudgy odor and flavor. Smoke until you obtain a medium brown color. The

temperature of the smoke house should not go above 120° F. or the meat will drip some of the grease out and may catch on fire.

If possible use green hickory for smoking. The fire may be started with corn cobs; maple, apple, or any hard wood will give a satisfactory flavor. Never use pine as this will make a sooty smoke and will give a resinous flavor. Corn cobs may be used for the entire smoking.

FIG. 37.—Showing proper method of cutting cured ham: A, butt; B, center; C, shank. Bake the butt, fry the center, and boil the shank.

Storing the Meat.—If cured meat is to be kept any length of time, it should be wrapped in paper or placed in a tight bag and then hung in a dry, dark, vermin-proof building. The wrapping will prevent the meat from drying out and becoming hard and will also help to keep the flies away.

Never try to wrap the meat and hang it by the same strings that were used in smoking. It is impossible to tie a paper or muslin bag around this string tight enough to make it insect proof. The bags of meat can then be painted with a yellow wash.

The following yellow wash is recommended by the U. S. Department of Agriculture.*

* Farmers' Bulletin 1186.

For 100 pounds of hams or bacon use
3 pounds of barium sulphate
1 ounce of glue (dry)
1¼ ounces chrome yellow
6 ounces flour

Thoroughly mix the flour into a half-pail of water, breaking up all lumps. Mix the chrome yellow in a quart of water in a separate vessel, add the glue and pour both into the flour and water mixture. Bring the whole to a boil and add the barium sulphate slowly, stirring constantly. Make the wash the day before it is required. Stir it frequently while using, and apply with a brush.

IOWA STATE COLLEGE
DEPARTMENT OF ANIMAL HUSBANDRY
Meat Laboratory
Students' Score Card

CURED HAM

	Scale of Points	*Perfect Score*
1.	WEIGHT—8-12 pound Average	5
2.	FORM—Cut from side at right angles to hind shank. Foot removed just above point of hock. All cut surface should be free from ragged edges	5
3.	COLOR—Outside medium brown. Lean uniformly pale pink or reddish tinge. Fat white and free from blood spots	10
4.	MARBLING—Lean should be well intermixed with fat. Proportion of total fat to lean about 75% of lean and 25% fat	20
5.	FLAVOR—Pleasing to the taste, pleasant, slightly smoky odor. Medium salt and smoke, not strong.	30
6.	CURE—Good keeping qualities, firm texture, uniform color, sweetish meat odor	20
7.	QUALITY—Fine grain, free from coarse fibers, velvety to the touch, firm texture, free from flabby fat	10
	TOTAL	100

Name ..... Date .....

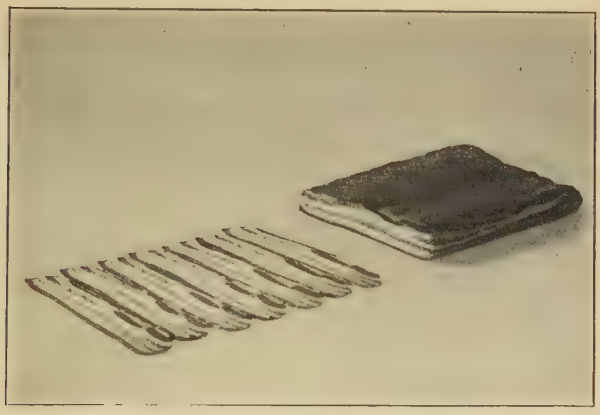

FIG. 38.—Cured bacon. The result of care in selection and curing.

IOWA STATE COLLEGE
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Meat Laboratory
Students' Score Card

CURED BACON

	Scale of Points	*Perfect Score*
1.	WEIGHT—6-10 pounds Average	5
2.	FORM—Rectangular in form and neatly trimmed. All rib ends removed. No deep cuts	5
3.	COLOR—Outside medium brown. Lean, uniformly pale pink or reddish tinge. Fat white and free from blood spots	10
4.	MARBLING—Lean should be well intermixed with fat. Proportion of total fat to lean about 40% lean and 60% fat	20
5.	FLAVOR—Pleasing to the taste, pleasant, slightly smoky odor. Medium salt and smoke, not strong..	30
6.	CURE—Good keeping qualities, firm texture, uniform color, sweetish meat odor	20
7.	QUALITY—Fine grain, free from coarse fibers velvety to the touch, firm texture, free from flabby fat	10
	TOTAL	100

Name ..... Date .....

Specifications and Bill of Materials for Hollow Tile Smoke House.—The fire-proof smoke house shown in Fig. 39, is 7 ft. square and 9 ft. high. The footings, floor, curing vat, the lower walls, and the roof slab are all of concrete. The walls as shown are of hollow clay blocks, making a wall 4 inches thick.

The foundation wall should extend at least 12 inches below grade. When the building site is dry, this depth is sufficient. When wet, the site should be well drained and it is advisable to place a few small steel rods (such as old silo hoops and bridge rods) in bottom of concrete to prevent cracking or upheaval due to freezing. Make footing 10 inches thick at the bottom and tapering to 6 inches at the top. Build the 6 inch concrete wall 2 ft. 3 inches above the grade line. The concrete floor is to be 4 inches thick and should be underlaid by a drainage base of pebbles or clinkers at least 6 inches thick. This will insure a dry floor.

Concrete for the foundation is to be made with one part Portland cement, two parts clean coarse sharp sand, and five parts of pebbles or stone broken in pieces not larger than two inches. Walls above grade and floor to be made of one part Portland cement, two parts sand and four parts pebbles. If mixing by hand, mix the cement and sand thoroughly before adding the pebbles or stone and water. Build the walls up level and trowel all exposed portions and the floor to a smooth surface.

The hollow clay blocks are laid up in the wall with ½ inch joints. Mix the mortar with one part cement, ⅓ of one part of lime, and three parts clean sand. Build the walls up true and plumb. If special corner blocks cannot be had, common chimney brick may be used for the same purpose in the building of the solid corners. In the top course of blocks set six blocks on

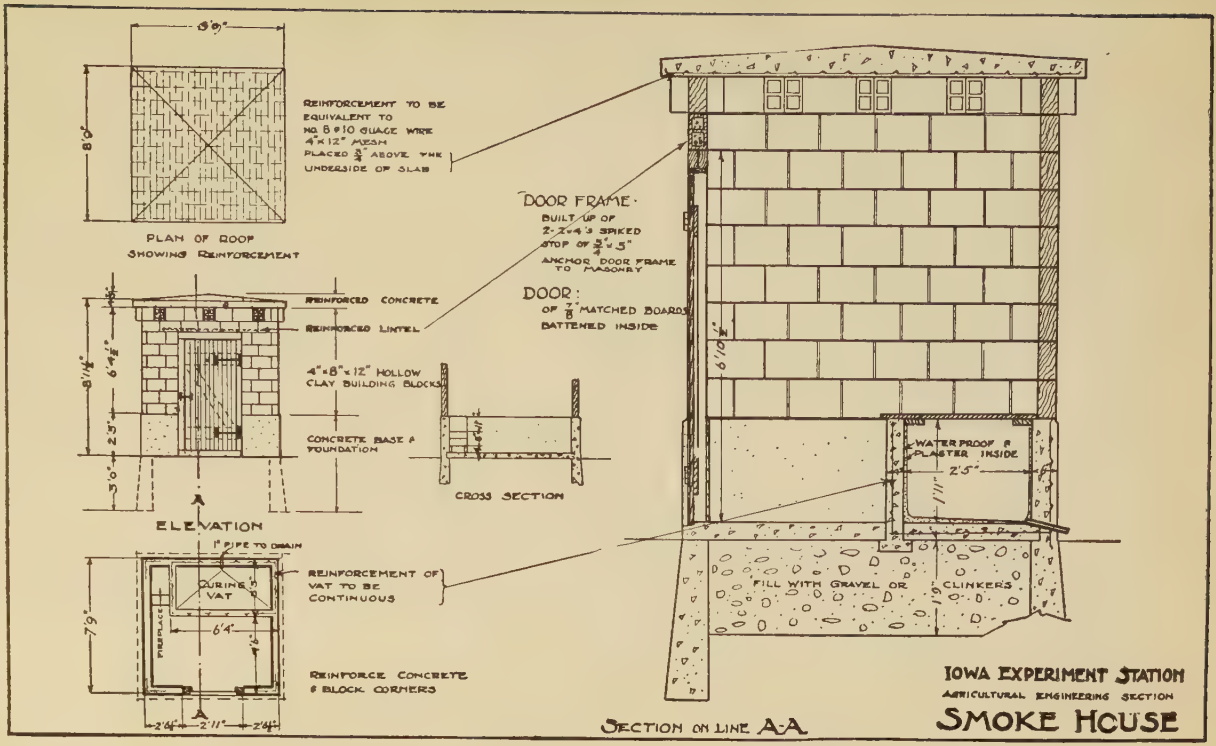

FIG. 39.—Details of construction of Iowa Experiment Station smoke house.

each side, cross-wise on the wall, with the ends cut as shown on the drawings.

The door frame is made of double thick 2 x 4 inch material which is to be built up and set in place before the walls are erected. Drive 10-penny nails part way

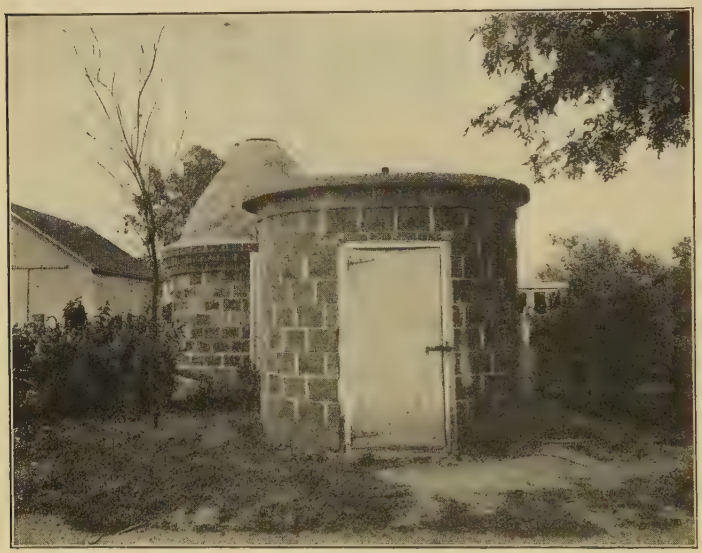

FIG. 40.—Exterior of Iowa Experiment Station smoke house.

into the outside of the frame so as to provide a secure bond between the frame and the masonry.

The lintel over the doorway is built of hollow tile, the same as the walls, except that the air spaces are to be filled with concrete and two $\frac{3}{8}$ inch steel reinforcing rods placed in the lower air cell.

The roof slab and the curing vat are of concrete reinforced with a wire mesh equivalent to No. 8 and No. 10 gauge wire, 4 x 12 inch mesh, placed $\frac{3}{4}$ inch above the under side of the roof slab, and near the outside of

BILL OF MATERIALS

HOLLOW TILE SMOKE HOUSE

Concrete	*Cement Sacks*	*Sand Cu. Yds.*	*Gravel Cu. Yds.*
Foundation, 56 cu. ft. (1-3-5)	10.	1.0	1.8
Upper Walls, 16 cu. ft. (1-2-4)	3.6	.27	.54
Floor, 8 cu. ft. (1-2-4)	1.8	.14	.27
Curing Vat 12 cu. ft. (1-2-3)	3.	.23	.34
Finish, 4 cu. ft. (1:;-½)	2.8	.05	
Roof, 30 cu. ft. (1-2-3)	8.	.58	.86
204 4 in. x 8 in. x 12 in. clay tile			
150 Common Brick			
Mortar	4.	.5	
½ bbl. Lime			
	33.2	2.77	3.81

Reinforcement

120 sq. ft. wire mesh No. 8 and 10 wire, 4 in. x 12 in. mesh 2-⅜ in. rods.-5 ft. 6 in. for lintels.

Door Frame

25 ft. 2 x 4-7 ft.
25 lin. ft. ¾ in. x 3-stop.
10 ft. lin. 1 in. x 8 in.

Door

25 ft. 6 in.-D and M Boards
1 pr. door hinges
1 door lock

the curing vat walls. The concrete is to be made with one part cement, two parts sand, and three of gravel.

The roof is to be built in place on a form consisting of inch boards laid on 2 x 4's running through the open blocks in the top course and supporting the cornice in the same way.

The roof slab should be 4 inches thick at the outsides and 7 inches in the center. The surface should be troweled smooth and even.

In building the curing vat make the walls 4 inches thick, using concrete of the same proportions as for the roof slab. Waterproof the inside walls and bottom

and also apply a coat of cement plaster; finish the vat; and for a drain put in a one inch pipe to the outside of the smoke house as shown in Fig. 39.

Build the door of six inch flooring lumber and securely brace with 8 inch cleats and hang on "T" hinges as shown in the drawings.

Rendering Lard.—About fifteen per cent of the weight of the average butcher hog is made into lard. The leaf fat makes the best lard and the gut fat the poorest. These should never be rendered together. Use the leaf fat, back fat, and all fat trimmings. Be sure that all of the lean is trimmed out; it may stick to the kettle and discolor the lard. It is not necessary to remove the skin. Place the fat in a cool, thoroughly cleaned kettle. Cook over a moderate fire and stir frequently to prevent sticking to the kettle and scorching. Do not fill the kettle too full or it may boil over and catch on fire.

It requires some experience to know just when to take the lard off of the fire. When the little white blisters form on the cracklings and the cracklings turn brown and float it will soon be time to remove the lard from the fire. As a final test dip some of the cracklings up with the stirring paddle and if they fry themselves dry very soon after being dipped up the lard is ready to come off. The little white bubbles should be pretty well cooked off before the lard is finished.

Rendering lard is simply cooking the fat to break down the fat cells and drive off the moisture and obtain the pure fat without the cellular tissue or the moisture. Two to three per cent of moisture is sufficient.

Remove the lard from the fire and allow it to cool slightly, press out the cracklings and strain the lard through a cloth into cans or jars which have been

thoroughly cleaned. As the lard cools it should be stirred slowly. This whitens and makes the cold lard more uniform in texture and finer grained. This lard if properly rendered will keep several years in air tight jars without becoming rancid. If it does become rancid it may be improved some by melting and adding slices of raw potato. This will take up some of the odor and render it a little more palatable. The vessels should be stored in a cool, well ventilated, dry, clean place. When using lard from a vessel always take the top off evenly, do not dig down into the lard at one side or in the center or the part on the sides will soon become rancid after being exposed to the air.

Sour Lard.—When lard is not thoroughly cooked an excess of moisture will remain in the fat and will cause the lard to sour which can easily be detected by the sour odor.

Rancid Lard.—When lard becomes old and is kept under improper storage conditions in a damp warm place it soon becomes rancid. This may be detected by the taste, odor, and by chemical test for free fatty acids. "To test,* heat it by rubbing a small portion vigorously in the palm of the hand, then smell quickly; or place some in a small glass and immerse in a vessel of hot water, then, if rancid, the fumes given off from the hot lard will readily reveal that condition. It also may be determined by the taste, but this method is useless if more than one sample is to be tested, as the rancid taste will remain in the mouth and render the tasting of other samples useless or even deceptive."

The Grades of Lard on the Market.—Lard from the packing house is sold under six different names, depending upon the fat used and the method of rendering.

* Meat Hygiene—Edelmann, Mohler and Eichhorn.

Kettle Rendered Leaf Lard is the highest grade; only leaf fat is used and it is rendered in an open kettle just as it is on the farm.

Kettle Rendered Lard is made from fat trimmings and may or may not contain any leaf fat. Rendered in an open kettle.

No. 1, Neutral Lard is made from leaf fat only, but is rendered at a lower temperature than the kettle rendered. It is tasteless, free of acids and impurities, smooth grained, and remains unchanged in odor and color.

No. 2, Neutral Lard is made from ordinary fat trimmings.

Prime Steam Lard is made from fat trimmings and internal fats. It is rather coarse grained and dark in color and can be stored and shipped more economically than the other forms of lard.

Refined Lard is Prime Steam Lard put through a refining process by bleaching and stirring.

Lard Compound is a mixture of some lard, and any of the animal fats and some vegetable oils.

Recipes for Sausage and Other Pork Products.—By making the trimmings and scraps into sausage you are able not only to utilize all of the scraps to the very best advantage but to make a palatable, wholesome and attractive product out of scraps which would not be used to the best advantage otherwise. Some of the cheaper cuts can also be used in this way to very good purpose. But one thing must be kept in mind, namely that a first-class finished product cannot be produced from a second-class raw product. Too many people have the idea that because it is sausage anything may be put into it and still produce a good product. Sausage should never be too highly seasoned, as this takes away the meat flavor.

If you cannot eat the product without the high season, you had better do without it.

Tools Necessary for Making Sausage.—Every farmer should have a small sausage grinder and a combination sausage stuffer and lard press. A medium-sized sausage grinder is a convenient size; you should have a coarse and a fine plate with this. Stuffer attachments may be obtained for the grinder. However, a combination 8 quart stuffer and lard press will be found very handy on the farm. If you wish to stuff the sausage, a casing of some kind will be necessary. The small intestine of the hog is quite commonly used for this. Muslin bags about 2 inches wide and 12 to 14 inches long make handy casings. The hog stomach and bladder are also used.

Pork Sausage.—Never use anything but clean, fresh pork. The very best pork sausage may be made as follows: Use about three fourths lean and one fourth fat, grind through a medium plate and season as follows:

For every fifty pounds of pork use one pound of fine salt and two and one-half ounces of finely ground black pepper. If you like the taste of sage, use three ounces of pure leaf sage finely powdered. This seasoning will suit the taste of the majority of people. Mix the seasoning into the meat thoroughly and it is ready to fry. Many people make the mistake of grinding their pure pork sausage too fine. This sausage may be stuffed into casings and smoked for about two hours or it may be used in bulk. This can be fried down or canned. (See Chapter Canning and Preserving Meats.)

Head Cheese.—Trim all meat from the head and soak over night in water containing a little salt. Then cook with hearts, tails, tongues, and feet, or any of the other trimmings for which you do not seem to have other use. Cook until the meat can easily be separated from the

bones. Dip off the liquid and chop meat fine. Return meat to kettle, season to taste with salt and pepper and cover with liquid and boil about 15 minutes longer. Pour the mixture into a shallow pan, cover with cheese cloth, and weight down. When cool, slice and serve without further preparation. (*See* Fig. 41.)

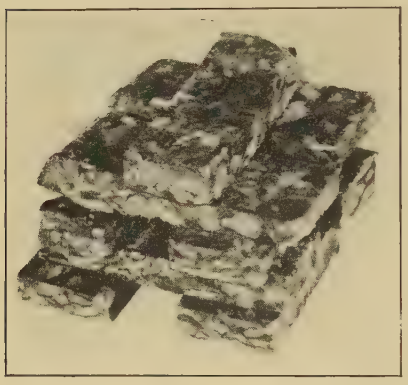

FIG. 41.—Head cheese or "souse."

Scrapple. — Use the same kind of meat and proceed the same way as with head cheese until the liquid is poured over the finely chopped meat. Then season and stir corn meal into the boiling liquid and meat until the mixture is about three-fourths mush and one-fourth meat. Be sure to add the meal slowly and stir constantly or big lumps of meal will form. Boil thoroughly and pour into shallow pans to cool. Slice and serve cold or fry in fat. (*See* Fig. 42.)

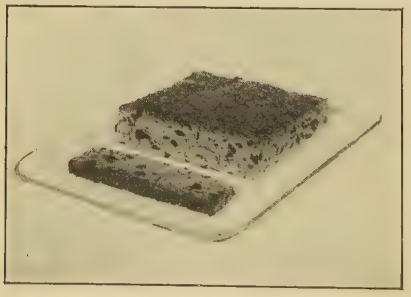

FIG. 42.—Scrapple.

Pickled Pigs' Feet.—Clean the pigs' feet thoroughly

and boil four to six hours, depending on size and age. Salt when about half done. Pack into a tight vessel (stone jar preferred) and cover with hot spiced vinegar. Serve cold or fry in a batter made of eggs, flour, milk, and butter.

Hard Soap.—All the soap-making material, whether it be the carcass of the animal or any part of the carcass, or fats, or whatever it may be, should be cooked if possible until the bones dissolve. This, of course, is rather a long process with an open kettle but can be easily done with a steam pressure kettle. After the product is thoroughly cooked up, skim the melted fat off the top and clarify by adding one pint of cold water to 2 or 3 pounds of melted fat. The fat will solidify on top of the water and the other material will be left at the bottom of the water. To every 7 lbs. of melted fat add 1 lb. of lye dissolved in 3 pts. of water and stir until it resembles honey. Care should be taken that the fat is not too hot when the lye is added. The fat should not be over 115° F. and the lye and water should not be over 80° F. Pour the mixture into wooden or pasteboard boxes or granite pans. When almost hard, cut it into squares. Tin vessels should never be used for this purpose. Allow this soap to ripen a month or so before using, in order that the lye may be completely united with the fat.

Tankage.—To make tankage of refuse, use the material left in the kettle after the soap has been skimmed off. If the bones are not thoroughly dissolved, all the material should be run through a bone grinder of some kind. This material should be thoroughly dried on the stove or in some other place where the drying will take place faster than in the sun. This product can be used as stock food while it is green (before it is dry), but it

will not keep any length of time. After the green tankage is thoroughly dried it will keep for some little time. This can be used as stock food in the same way as the tankage purchased from other sources.

If this tankage molds, due to damp weather or not being thoroughly dried, it should not be used as a feed.

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PART TWO

BEEF

PART TWO—BEEF

INTRODUCTION

Beef is one of our favorite meats, especially in the city. Beef does not constitute as large a proportion of the meat consumed on the farm as it should. This is due partly to the fact that many farmers do not know how to kill and cut beef to the best advantage.

The carcass is usually quite large for one family to use up while fresh, especially in warm weather. This is not so objectionable now since meat can be canned so successfully. All fresh meat is quite perishable, and heavy and discouraging losses are often sustained through improper handling.

Beef can be aged or ripened more successfully than any other class of meat; it usually spoils from the outside in, so that even though the mold is an inch long on the outside the chances are very good that the inside will be in splendid condition.

Beef will cure quite easily and can be allowed to remain in the cure or brine until used up. By parboiling the pieces used last, they will taste just about like the first.

Beef can be dried more successfully than any other class of meat. Beef can be cut and prepared in a great many different ways.

CHAPTER V

THE SELECTION OF BEEF FOR BUTCHERING

Health.—Always be sure that a healthy animal is chosen, whether it is an old, thin cow or a prime baby beef. The animal should be observed for a few days before killing to see whether or not it acts and looks like a healthy animal. Never take chances with a diseased animal.

Tuberculosis is the disease most commonly met with in beef cattle. A generalized case can easily be recognized by any farmer. Examine the liver, lungs, spleen (the dog-tongue shaped organ lying near the paunch), ribs, and back bone, for little pockets of yellow pus or granular material. They indicate a tubercular condition. Little pockets of pus quite often hang from the inside of the rib. A carcass of this kind should be cooked until the meat falls from the bones before being fed to hogs or chickens.

Injured animals should be bled at once and can be used exactly as any other animal. They should not be allowed to suffer, as this raises the body temperature and may cause the meat to spoil.

Condition.—The animal should be neither very thin nor very fat. The condition of the beef may vary a great deal and yet produce good meat. However, very thin animals will not produce tender, juicy, well flavored meat. In older animals the muscular portion of the carcass is generally tougher when in a thin condition

than when fat. A good growthy steer or heifer, fattened rapidly to a medium condition weighing about 800 pounds, makes a handy size and should furnish an excellent grade of meat.

A medium layer of fat on the outside is essential, if the beef is to be kept any length of time without curing. This outside layer becomes firm through cooling and loss of moisture and thus protects the fleshy portion (lean meat or muscle) from spoiling or molding.

Age.—A beef animal may be killed at any age after 21 days. The best grade of veal should be about eight weeks old; anything younger than this would be a little too watery, and lacking in flavor. Usually the best beef may be obtained from an animal 18 to 30 months old.

Breeding and Type.—Well-bred animals of the strictly beef type will dress out a higher per cent of edible meat than the scrub. The beef bred animal will also have a firm, white covering of fat over bright red lean which is well marbled or mixed with fat. The beef animal will also have a better flavored meat. The dairy animals quite often kill out yellow; that is, with a yellow color to the fat. Quite often the fat dairy animals have well marbled lean. The lean is often a very dark red in color. The muscular development is the part of an animal that makes it valuable for meat. The difference in muscular development is plainly seen in the Figure 43, showing two calves, each about one week old. Fat can be put on by feeding, but the muscle characteristic must be inherited.

Quality.—The smooth, uniformly covered steer, free from patches and bunches of fat will yield a very desirable carcass and cut out with very little waste. A high quality animal always presents a more attractive

FIG. 43.—Beef calf and dairy calf, each one week old, showing advantage of beef breeding and type. Note the marked difference in fleshing.

carcass, and attractiveness has a market value which is also worthy of consideration. Always avoid the heavy hided, coarse bone cattle.

Sex.—This factor is quite often taken unfair advantage of. The beef from an eight hundred pound heifer in medium condition is just as good as that from an eight hundred pound steer of the same age, weight, and condition. When a high finish is put on "she stuff" it does not distribute the fat quite so evenly as the highly finished steer. Steers are usually a little heavier muscled than heifers. The heifer may have a little heavier kidney. The buyer on the market discriminates against all open "she stuff" because he expects it to dress lower. They are usually pregnant.

At the present time the discrimination against open heifers amounts to about 50 or 60 cents per cwt. and for spayed heifers about 25 cents per cwt.

Englishmen make no discrimination against heifer beef. They sometimes pay more for it than for steer beef. They claim that it is of better quality and is better marbled.

The author is of the opinion that no one looking at a prime rib roast or a porterhouse steak can tell whether it is steer or heifer beef.

Dressing Per Cent.—Buyers become quite expert at estimating the dressing per cent of cattle. In addition to the condition, age, breeding, type, quality, and sex, the buyer must be able to tell about what the steer will yield, in terms of carcass to live weight. The dressing percentage depends on the paunchiness, fatness, quality, and type.

The paunchy steer will have the digestive organs filled with feed and water which is called "fill" which will cut down on the percentage of the dressed weight to the

live weight. Twelve hundred pound steers frequently carry from 3 to 5 per cent of their entire weight in their digestive tract.

A difference of two per cent dress on a twelve hundred pound steer selling at 10 cents a pound makes a difference of $2.40 on just one steer. This loss would be on paunchiness alone.

Fat steers always outdress animals with less finish. The shanks, head, and hide will weigh almost the same on either a fat or thin steer; and this is also true to a certain extent of the internal organs although the internal fats would be heavier in a fat steer than in a thin one.

Quality or degree of fineness of the head, hide and bone may affect the dressing per cent by 1 to 2 per cent.

Type is also important. The broad, deep, well formed steer will always outdress the wedge shaped dairy type steer even when condition and fill are the same. This difference will vary from 3 to 5 per cent.

The average run of steers killed by Armour and Company dress about 53 per cent, good, to choice ranging from 56 to 59 per cent, with show steers going from 59 to 63 per cent.

The following tables show the dressing percentages of the prize-winning steers in the carcass contest at the International Live Stock Exposition for 1920-21:

TABLE VIII

CARCASS OF SENIOR YEARLING STEER OR HEIFER

1920

Prize	*Live weight*	*Dressing, per cent*
1	1,250 lbs.	65.84
2	1,370 lbs.	65.84
3	1,170 lbs.	66.41
4	1,280 lbs.	64.92
5	1,160 lbs.	61.55

CARCASS OF JUNIOR YEARLING STEER OR HEIFER

1920

1	960 lbs.	64.84
2	1,160 lbs.	64.82
3	1,230 lbs.	66.99
4	1,120 lbs.	65.18
5	1,180 lbs.	64.06

CARCASS OF SENIOR YEARLING STEER OR HEIFER

1921

Prize	*Live weight*	*Dressing, per cent*
1	1,360 lbs.	67.57
2	1,250 lbs.	69.60
3	1,270 lbs.	70.00
4	1,370 lbs.	65.99
5	1,110 lbs.	67.21

CARCASS OF JUNIOR YEARLING STEER OR HEIFER

1921

1	1,110 lbs.	62.52
2	1,220 lbs.	66.48
3	990 lbs.	66.97
4	1,120 lbs.	66.16
5	970 lbs.	64.23

Benholm, a two year old steer exhibited at the 1885 Chicago Show, dressed out 71.4 per cent. The world's record is held by a spayed Aberdeen-Angus heifer killed at the Smithfield Fat Stock Show in London, which dressed 76.75 per cent.

According to Vaughan,* the average dressing per cent of the different market classes of cattle would yield the following percentages.

Fat Steers	55–67 per cent
Butcher Stock	50–61 per cent
Cutters and Canners	35–55 per cent
Veal Calves (Skin on)	65–70 per cent

* Vaughan, H. W., Types and Market Classes of Live Stock.

CHAPTER VI

KILLING AND DRESSING BEEF ANIMALS

Management of Animal Before Slaughtering.—Nothing but pure water should be given to the beef animal selected for at least twenty-four hours before slaughtering. It is difficult to bleed thoroughly an animal just off of full feed. Tissues from which the blood has not been thoroughly drained will spoil much more quickly than otherwise. This is sometimes spoken of as a "fiery" carcass (spotted with highly colored blood vessels due to incomplete bleeding). Keep the animal as near normal temperature as possible. Excitement of any kind will raise the temperature above normal and if it goes high enough it will cause the meat to turn dark in color and sour in a few hours' time. Animals dying from an overheated condition are never fit for food, as the meat spoils almost immediately.

Bruises of any kind will cause the blood to settle in the affected part and spoil the keeping qualities of the particular cut bruised. The unfortunate part about this is that the bruises are most common on the highest priced cuts.

Tools for Killing and Cutting Cattle.—

A killing ax, hammer, or gun.

A six-inch skinning knife.

An eight-inch butcher knife.

Either a scaffold for hanging or a block and tackle for hanging to a tree.

Doubletree or neck yoke can be used to spread and hang the beef.

Tub of cold water and some clean cloths for washing carcass.

A stick about 30 inches long, sharpened at both ends,

FIG. 44.—Ready to be killed.

or a couple of chunks of wood or stone to hold beef on its back.

A 28-inch meat saw.

A 12-inch steel is handy, but not absolutely necessary.

Be sure that all tools are ready before proceeding to kill.

Killing.—If the butchering is done in warm weather, select as cool a day as possible and kill in the evening, thus allowing the carcass to cool during the night. It is also necessary to select a good place to kill. If the animal is tame, a noose can be slipped around the neck

and nose and the animal drawn down to the base of a tree, fence post, or corner of the barn, or any other solid fixture, and then stunned with an ax or sledge. Be sure the tree, post, or other fixture is absolutely solid before attempting to draw an animal down. (*See* Fig. 44.) A tree whose limbs are low enough to per-

Fig. 45.—Sticking the beef.

mit of fastening a block to use for hoisting the beef is best.

Shooting and Stunning.—In case the animal is too wild to touch with a rope, use a rifle. In this case it is not always possible to get it just where you want it. Sometimes if a number of cattle are together and are accustomed to being salted out in the pasture, and the feeder sprinkles a little salt near the selected tree, the cattle will come up and then it is possible to shoot the one you want to kill.

The animal should be struck with bullet or hammer in just about the center of the forehead. Draw an imaginary line from the lower side of the base of each horn to the opposite eye and strike where these lines cross.

Sticking.—After the animal has been stunned and is down, stand in front with your back toward the animal, placing one foot next to the head and the other just in front of the front feet, and then push the head back as

FIG. 46.—Head removed and tongue loosened.

far as possible. (*See* Fig. 45.) A skinning knife can be used to open the neck toward the head. Then insert the knife with the back of the blade against the breast bone, cut straight in about four inches deep, with the point toward the backbone, and pass on either side of the windpipe. This will sever the carotid arteries just where they fork near the point of the breast bone and will also cut the jugular veins, which pass near. Be careful not to cut back too far and puncture the chest cavity, as this will allow the blood to flow back and a bloody carcass will result.

Skinning.—Begin skinning at the head. Open the hide at the poll and cut straight down one side of the face to the nostril. Peel the hide back off of the face and forehead. Loosen the hide back a few inches from the poll. Now turn head up on poll, with the muzzle standing up, and press the muzzle down toward the ground and split the skin from the mouth up the center of the lower jaw to the cut made in sticking. Loosen

Fig. 47.—Dropping hind shank.

skin on both sides and, when head is skinned out, remove it by cutting just back of the jaw bones from the under side of the neck and remove the head at the first or atlas joint. This is very simple.

It is well to remove the tongue at this time by loosening it just inside of the jaw bones, from base to tip; pull up on tip end and pull the tongue out backward. (*See* Fig. 46.) Wash and scrape the tongue clean and hang up by either end.

The brain can also be removed at this time by sawing or chopping in at the side between the eye and horn

and then peeling the poll back until the brain can be lifted out readily.

The beef cheeks should also be trimmed off and used for either stew or hamburg.

The next step is to roll the animal on its back and brace it there by means of a chunk on the side or by means of the stick or prop mentioned above.

Dropping the Shank.—Drop the fore shank by cut-

FIG. 48.—Shanks dropped at straight joint.

ting off sinews just where the hair joins the back of the hoof; this will straighten the leg. Now whittle off the two dew claws and open the hide on the back of the shank from the hoof to a little above the knee. (*See* Fig. 47.) Loosen the hide a little down on either side of the shank and then cut the shank off at the lower or straight joint, which is just where the knee begins to enlarge, and pull the shank out backwards. The rough joint or horse joint is very close above the straight joint; if removed here it makes a bad appearance. Drop both fore shanks in this way, then drop hind shanks at

the lower joint. Be sure to drop hind shank at the lower or smooth joint or you may have trouble in hanging the carcass.

When splitting the skin over the hock, pass the knife on down over the round to the mid-line about six inches back of the cod or udder. Hold the knife flat, with the point and edge turned up slightly to avoid cutting the flesh. Drop the other hind shank in the same manner.

Fig. 49.—Siding beef with long, easy, downward strokes.

Skinning the Sides or Siding.—Now open the skin on the mid-line, from the cut made in sticking to the tail. Skin down the sides by starting the knife at the brisket on one side and the flank on the other, using a long, easy, downward swing of the knife. (*See* Fig. 49.)

Do not try to pull the hide away from the meat, but hold it as tight up to the meat as possible. Do not hold the knife too stiff. Keep the edge of the knife cutting toward the hide. There is a thin, white membrane, known as the fell, between the hide and the meat. This should be left on the meat as a protection.

The hide should be loosened over the buttocks and inside of the thigh, leaving the hide on the round, fore shank and neck to protect the carcass while being hoisted.

FIG. 50.—Opening the abdominal cavity.

Opening Abdominal Cavity.—The brisket and abdominal cavity should be opened on the mid-line, holding the handle of the knife on the inside to protect the intestines. (*See* Fig. 50.) The muscle should be left intact for a few inches just in front of the navel, to hold

FIG. 51.—Sawing through the breast bone.

FIG. 52.—Holding intestines out and sawing through pelvic bone.

the paunch and intestines in until you are ready to drop them.

Saw through the breast bone and loosen the gullet and windpipe. (*See* Fig. 51.) Cut through the muscle in the center of the pelvic region between the hind legs. Pull some of the intestines up on the side of the carcass and saw through the pelvic or aitchbone. (*See* Fig. 52.)

FIG. 53.—Removing sheet of caul fat from around the paunch.

At this time it is well to remove the sheet of fat (caul fat) around the paunch. (*See* Fig. 53.) Wash all bloody or soiled spots off.

Skinning the Rump or Rumping.—Insert spreader or beef tree in hocks and the carcass is ready to hoist high enough to work handily at the rump. (*See* Fig. 54.) Finish skinning out the buttocks as shown in Fig. 55. The hide can then be pulled from the hock down almost to the flank. This should be done very carefully so that the fell will not be torn and the meat exposed.

Skin out the tail by loosening hide on under side, open hide to point of tail bone, drop hide around base of tail, unjoint and grasp butt end with dry cloth and pull it out. If you desire to leave the tail attached to the carcass, pull down on the hide at the base of the tail and you will pull it off of the tail. Drop hide about half

FIG. 54.—Ready to hoist.

way down the back. Loosen rectum and drop as far as kidneys. (*See* Fig. 56.)

Splitting.—Spread the hind legs and split the center of the backbone down to the loin. Great care must be taken to keep the saw in the center. The saw guides much more easily if you stand behind the carcass, but you can see much better if you stand in front. A satisfactory job can be done standing on either side. (*See* Fig. 57.)

FIG. 55.—Rumping the beef.

FIG. 56.—Dropping the bung.

Wash the hocks and rounds clean and dry thoroughly. Hoist the carcass high enough to allow paunch to be taken out. When removing heart and lungs, be careful to leave all of the lean part of the membrane which separates the paunch or abdominal cavity from chest cavity attached to the ribs. All of the hanging tenderloin which holds this muscle should be left also.

Fig. 57.—Splitting the beef carcass.

Remove the hide from fore shanks and neck, finish splitting the carcass, wash thoroughly, and pump the shoulder by raising and lowering the fore shank, thus draining the blood from the artery in the shoulder. Trim off any ragged edges and hoist carcass out of the way of dogs and allow to hang all night, if possible, during warm weather. (*See* Fig. 58.) If this is done, you must get it down the next morning by daylight, so that the flies will not have a chance at it.

Care of Offal.—

Hide.—If you expect to hold the hide for a few days,

it is best to salt it by spreading it out hair side down and covering the skin side evenly with a heavy layer of salt. Fold the legs and head end in until the hide forms a strip from one and one-half to two feet wide. Start at the head and roll tightly. Use a strong, heavy twine, and tie securely.

Fig. 58.—Ready to cool out over night if need be.

Gall Bladder and Liver. — The gall bladder should be removed from the liver as soon as possible after the liver is taken out. This can be done very easily by cutting the bile duct about three inches in front of the bladder, and usually you can pull up on this and the bladder will peel out of the liver. It may be necessary to assist slightly with a knife. In case some of the gall gets on the liver, wash it off at once with cold water. Clean all blood out of the heart and wash thoroughly.

Intestinal Fat.—All of the intestinal fat should now be stripped off and saved. This can be done by pulling out the small intestine with one hand and cutting off

the ruffle fat with the other. Sometimes in young animals the fat can be pulled off with the hand. All internal fat should be washed thoroughly and placed in a bucket of cold water to chill before trying out. This fat can be used for making soap.

Tripe.—In case you want to use the tripe, proceed as follows: Open paunch and clean out all contents. Wash it thoroughly in four or five waters. Then scrape the thin membrane off, both inside and out. This can be done very well with a bell-shaped hog scraper. Soak the tripe in a weak solution of lime water about six hours, when it is ready to be cooked. Be sure the cooking vessel is clean, or the tripe will not come out white in color. Do not cook fast; bring the water to a boil and then allow it to simmer until tender. If it is boiled any length of time, it will toughen rather than get tender. As a rule, it is best to pickle it in strong vinegar. Pickled tripe is always on sale in the markets of our larger cities.

Judging Carcass Beef.—The beef carcass is first split down the center of the backbone into sides. The right side is sometimes referred to as the "closed" side, meaning that the kidney knob or fat is more closely attached to the loin. The left side may be called the "open" side; here we find the kidney knob hanging rather loosely at the lower end. The two sides of beef are sometimes referred to as "cattle." When sold in this way they are spoken of as straight cattle. The two sides are usually about equal in weight and price per pound. The open side is sometimes a few pounds heavier. When the side is "ribbed" or cut apart the quarters are referred to as "fores" and "hinds." The "hinds" are usually a little lighter than the "fores," when the side is ribbed between the twelfth and thirteenth rib count-

ing from the front. Hinds are usually sold fifteen to twenty-five per cent higher than fores. The fores can be sold better in the winter time on account of the greater demand for boiling and stewing beef in winter than in summer.

Beef carcasses vary a great deal. If fat enough to cut into the regular beef cuts so that the entire side can be sold over the block, it is sometimes spoken of as "side beef" or "block beef." Where only a part of the carcass such as loins, ribs or rounds may be sold over the block the carcass is known as a cutter. When none of it can be cut into the regular beef cuts it is known as a canner.

Classes and Grades of Carcasses.—Carcasses of beef animals are classified as follows on the Chicago market: Steers, Heifers, Cows, Bulls, and Stags, Cutters, Canners, and Veal Calves. Each of these classes have different grades, which depend upon the following factors:

Finish.—Finish is probably the most important of all the qualifications of good beef. It refers to the amount and distribution of external fat. Perfect finish is indicated by a firm, smooth, uniform covering of white fat. A "modest kidney" of white fat and a small covering of firm fat on the inside of the ribs is also desirable. The fat covering is usually thickest along the back, and should range from one fourth of an inch to three fourths of an inch in thickness. If the covering is less than one fourth of an inch along the back, it will be far insufficient over the round, which is one of the last places to finish in the process of fattening. The beef will lack that sweet, juicy, rich flavor so characteristic of the higher finished beef. Some finish is necessary in order to ripen or age beef properly. If the lean is exposed it will mold and spoil much more quickly than if covered with a layer

of fat. If the external fat is more than three fourths of an inch thick, it will be wasty and quite often soft. In the higher finished carcass there is usually a large amount of fat between the muscles and also around the internal organs. This large amount of external fat is objectionable to the average consumer and adds practically nothing to the food value af the carcass.

Marbling.—A proper intermixture of the fat through the lean is never found on a poorly finished animal. The most valuable beef is that which contains the largest proportion of well marbled lean with a modest amount of external fat.

Color.—A bright, rich, red color in the lean and a clear white in the fat is desirable. A dark red or blackish color is objectionable. This may result from the kind of feed, but more often to the handling of the animal before slaughtering. Range cattle, wild or restless cattle, bulls and stags, and heifers in heat quite often cut dark. This not only detracts from the appearance, but meat of this kind will not keep long. A yellow fat also detracts from the appearance. This is thought by some people to be influenced by feed. It is practically always found in Jerseys and Guernseys.

Form or Shape.—The carcass should be well proportioned in length, width and thickness. The loin, ribs, and round should not be too prominent. A lack of development in the loin, ribs, and round with prominent hip bones and shoulder points is always objectionable.

Quality.—This refers to the degree of fineness of the flesh, bones, and fat. It may also cover color and finish. The cut surface should be smooth and velvety in appearance with a fine rather open fiber. Coarse, stringy flesh is an indication of poor quality; the animal may be old, staggy or poorly finished. Younger animals usually

show a finer texture of flesh. The refinement of the bones are indicated by size, color, and texture. The bones should be of medium size and reddish color on the cut surface. Avoid the white, flinty bones and those where the ends or "buttons" of cartilage on the tips of the spines are hardened or ossified into bones. This indicates that the carcass is from an old animal. The chine bones or spines will splinter instead of cutting with a smooth surface in older animals. Bright red lean and clear white flaky fat are also indications of refinement.

Soundness.—This refers to bruises or spots which not only detract from the appearance but also from the keeping qualities. Bruises are generally found on the higher priced cuts. Overripe beef which has been kept under insufficient refrigeration or ventilation is also considered unsound.

Sex.—The carcass of a steer may be identified by the cod fat. Steers also show a little heavier muscling in the leg and loin, a little heavier bone, and a shorter neck than cows. Steers and heifers are quite similar in their muscular development except that the heifers are a little more angular, wider at the hips, and usually a little lighter in weight. The heifer may also be distinguished by the udder fat. The heifer quite frequently carries more kidney fat and the covering is not quite so evenly distributed as in the steer carcasses. Heifers differ from cows in form, being less angular with shorter necks. The bone is also softer and the meat is a brighter red color. Cows also have the udder all cut out as clean as possible. Dressed bulls may be distinguished by their short heavy necks and shoulders and heavy rounds. The cod fat is absent. The meat is usually much darker in color.

Weight.—Heavier carcasses usually have the best form

and quite often carry a high finish. However, sufficient finish and quality are quite often found in the lighter carcasses. The heaviest carcasses seldom exceed eleven hundred pounds and the lightest is about two hundred and fifty. No definite line is drawn between the weights of beef and veal carcasses. The greatest demand is for the carcasses from cattle weighing one thousand to twelve hundred pound. This weight will produce the handy sized cuts.

Kosher Beef.—

Meat for the Orthodox Hebrews.—The Mosaic Law, found in Leviticus 17:14, says: "The blood is the life of all flesh; the blood of it is for the life thereof: therefore I said unto the children of Israel, ye shall eat the blood of no manner of flesh; for the life of all flesh is the blood thereof; whosoever eateth it shall be cut off."

From this scriptural reference the Jews have established a custom in regard to the killing and inspection of cattle that has been unchanged and which dates back to the time when the tribes were wandering in the wilderness. Meat killed under the Jewish rules is known as "Kosher Meat."

The religious officers who are especially fitted to do this killing are known as "Sochetts." The long bladed, razorlike knife which is used is spoken of as "Chaleff." The knife blades are usually about 18 inches long and two to three inches wide. The knife must have a very keen, smooth edge.

Method of Killing.—After the animal has been selected, it is raised from the floor, by means of a shackle around the hind leg, and attached to a hoist. The animal is raised just high enough to allow the shoulder to touch the floor and the neck and head lie on the floor. A helper (who may be a Christian) draws the head back

IOWA STATE COLLEGE
DEPARTMENT OF ANIMAL HUSBANDRY
Meat Laboratory
Students' Score Card

BEEF CARCASSES

	Scale of Points	*Perfect Score*
1.	AGE—Eighteen to thirty months preferred. Should have white buttons on spines or chine bones.....	5
2.	WEIGHT—Handy size 500 pounds to 750 pounds..	5
3.	SHAPE OR FORM—Compact, well proportioned, well developed, thick meated rounds, loins and ribs. Medium brisket, short shanks and neck. Long, curved ribs are objectionable	10
4.	FINISH—Thickness of external covering, smooth covering of white, flaky, firm fat. Uniformly covered with fat from ¼ to ¾ of an inch in thickness, not patchy or wasty. Not oily; light kidney.	20
5.	MARBLING—Thorough intermingling of fat and lean, high proportion of lean to fat	15
6.	COLOR—White fat, bright red lean; yellow fat and dark colored lean are very objectionable	10
7.	QUALITY—Medium sized bone of fine texture, not flinty. Cut surface of meat should appear velvety. Should have fine fiber not coarse and stringy. Lean and fat should be firm	10
8.	SOUNDNESS—Should be free from spots or bruises; uniform color. Not over ripe, sticky or moldy lean. Should be practically odorless	10
9.	FLAVOR AND TENDERNESS—Not too old; reddish bone; well marbled; minimum amount of connective tissue or gristle. The lean should be juicy and well covered with flaky white fat	15
	TOTAL	100

Name ..... Date .....

and the "Sochett" cuts the throat crosswise just back of the jawbones. The animal is then raised off of the floor and allowed to bleed to death. During the dressing process, which may be done by any one, the Rabbi makes several examinations and marks the brisket of all the animals which are satisfactory for the Jewish trade. The first five ribs are the only parts used for the Kosher trade. The rest of the carcass can be used by the general public.

The Kosher trade is a great benefit to the meat industry on account of the disposal of the forequarters. The demand from the general public for the cuts from the hindquarter is sometimes fifty per cent greater than for the forequarters.

Ripening or Aging Beef.—This refers to the practice of holding meat in cold storage above freezing to improve the tenderness and flavor of the meat. In cool weather this is very simple practice on the farm, but impossible in the summer time without sufficient refrigeration. Only the well finished carcasses can be ripened to good advantage. The thin, lean carcass will get sticky, mold, and will have to be trimmed so heavily to avoid the moldy flavor that it does not pay.

After slaughtering, beef undergoes a marked change in texture. At first the meat is very tender and soft. In the next stage the muscles harden, the fat cools and solidifies and the meat is quite hard and tough; this continues until decomposition sets in. In this third stage the meat becomes soft and tender and improves in flavor. This is due in part to the formation of acids which act upon the connective tissue. The degree of ripeness is judged largely by the length of the "whiskers," as the mold is sometimes called.

This is practiced to a large extent by concerns which

supply meats to a high-class trade and to fine hotels and restaurants and to dining car service.

Suitable cuts may be used for ripening if it is not desirable to ripen the entire carcass. The time required is from two to six weeks, depending upon the degree of ripeness desired. When ripened meat is properly trimmed and prepared there will be no mold flavor at all, but you will have a rich, juicy, tender, well-flavored piece of meat. One trial will convince anyone.

CHAPTER VII

CUTTING THE BEEF CARCASS

Always cut across the grain of the meat, if possible. The following method has been found to be the most satisfactory for the beef animal weighing from 700 to 900 pounds, but can and should be varied under certain conditions.

Quartering.—Face bone side of carcass. Count ribs, starting at brisket (*see* Fig. 59); stick knife through carcass between fifth and sixth ribs. This will mark the place where the chuck should come off when forequarter is lying bone side down. Stick knife through carcass again between the twelfth and thirteenth rib, marking the place where the side is divided into quarters. Count down seven and one-half vertebræ, beginning just where the backbone or sacrum starts to rise or slant toward the tail. (*See* No. 18 in Fig. 59.) Mark this point at 1.

Stand on the outside of the carcass and insert knife in mark between twelfth and thirteenth rib and cut downward toward your mark made along the back, 3 to 1. Then cut toward the flank, 3 to 2, cutting all but six inches of the flank. Saw off backbone and let forequarter swing on the flank.

This forequarter can be carried rather easily by placing your shoulder just back of fore shank against the brisket. Step forward as the flank is cut, and this will rest the quarter squarely on top of shoulder.

Forequarter.—Lay the quarter on the bench or table,

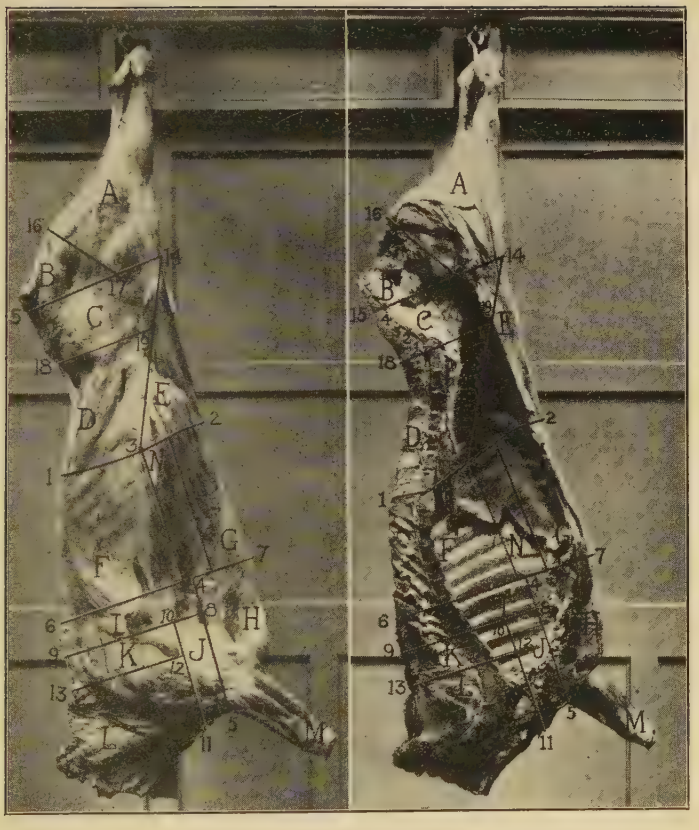

FIG. 59.—Location of the cuts of beef. A, round; B, rump; C, loin; D, short loin; E, flank; F, prime rib; G, navel; H, brisket; I, chuck rib roast; J, round bone pot roast; K, chuck roast; L, neck; M, shank; N, short ribs.

bone side down. Stand at neck end, facing quarter. Make cut from 3 to 4 and from 4 to 5.

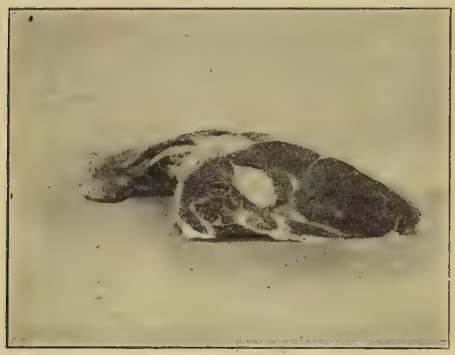

Fig. 60.—Fore shank of beef.

Shank.—Saw shank bone off on line 4 to 5 and cut shank loose from brisket. A small pot roast or a shoulder round steak or two may be cut from the shank. (*See* Fig. 60.) The shank is then cut into three or four pieces for soup, or it may be boned out for hamburg.

Plate.—The plate consists of the navel (G) and

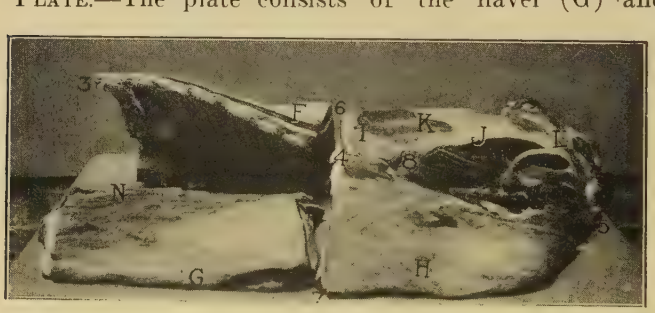

Fig. 61.—Showing cuts on forequarter. Letters and figures correspond to those in Fig. 59.

brisket (H), being separated on line 4 to 7. The diaphragm or large muscle on the inner side of the plate should be cut out for hamburg; it is often spoken of as

the "skirt" or "butchers' steak." (*See* Fig. 62.) It is rather tough for a steak, but is all edible meat and quite often can be purchased very cheaply.

FIG. 62.—The "skirt" or "butchers' steak."

NAVEL. — (G.) (*See* Fig. 63.) The navel can be cut across the rib and used for boiling or corning. The ribs when cut from four to six inches are spoken of as the short ribs of beef and may be roasted. The rib ends are then spoken of as the navel end.

BRISKET.—(H.) Cut across the rib and use for corning or boiling fresh.

PRIME RIBS.—(F.) Cut on line 4 to 6. This will give a seven-rib roast. The loin end of the rib will be a little

FIG. 63.—Plate of beef. G, navel end; N, short rib; H, brisket.

more tender and a little more economical than the chuck or shoulder end. (*See* Fig. 64.) This roast can be cut into any size pieces desired. A two-rib roast makes a handy size. These roasts can be used as standing rib

FIG. 64.—Prime ribs, showing standing rib roast and folded rib roast.

roasts by sawing out the backbone, or a little piece of the rib can be sawed out of the middle and the end folded over the eye of the meat or where the backbone came out;

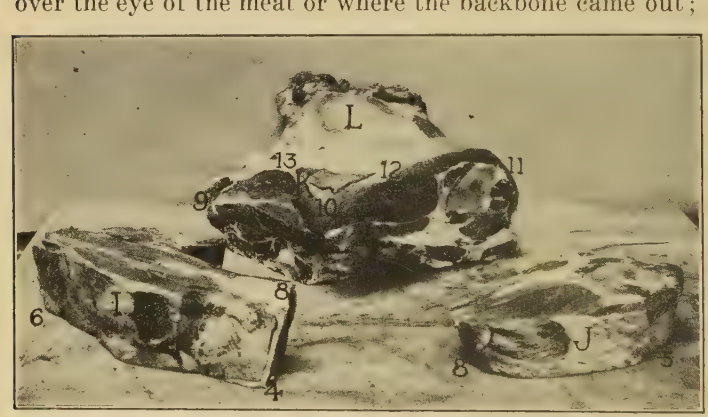

FIG. 65.—Showing method of cutting chuck. I, chuck rib roast; J, round bone pot roast or cross rib roast; K, chuck roast; L, neck.

the latter is called a folded roast. A rolled roast can also be prepared by removing all of the bones and rolling the roast. The roast will usually have a little better flavor if roasted with the bone in.

Chuck or Shoulder.—(I, J, K, L.) Two ribs should be cut from the rib end, 8 to 9, making a chuck rib roast (1). (*See* Fig. 65.) This makes a very good roast. It is often used as a pot roast or for boiling meat. The next cut, 10 to 11, will give the round bone pot roast or the cross rib roast (J). This cut will show the same surface as in Fig. 60, and can be used for pot roast or boiling, or may be cut into shoulder round steaks from the surface where the shank was taken off. Another nice chuck roast may be cut 12 to 13 (K). This makes an excellent pot roast or boiling piece. The neck (L) makes good mincemeat or a good boiling piece, and should be cut across the grain or fiber of the meat. This also contains the shoulder joint, which makes a good soup knuckle.

Fig. 66.—Hanging tenderloin split open.

Hindquarter.—Lay hindquarter on meat side. (*See* Fig. 67.) The muscle hanging along the backbone just below the kidney knob is spoken of as the "hanging ten-

FIG. 67.—Showing cuts on hind quarter. A, round; B, rump; C, loin end; D, short loin; E, flank; F, flank steak.

derloin." (*See* Fig. 66.) This is a part of the diaphragm muscle and is quite tough. It is usually used for hamburg.

FLANK.—Cut the flank off on line 14 to 3. This will make rather short steaks. (E.) Contains the flank steak. (*See* Fig. 68.) The flank steak is boneless, flat and rectangular in shape. The muscle fibers run lengthwise. They are rich in flavor, medium in tenderness and

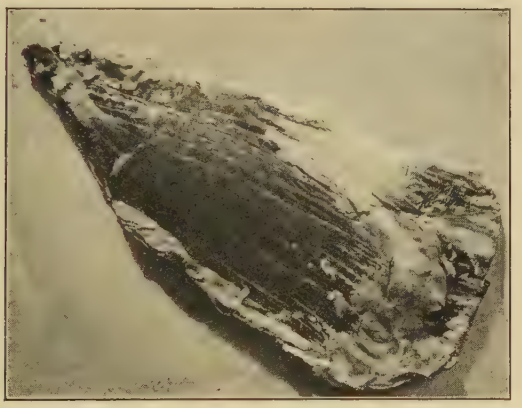

FIG. 68.—Flank steak.

usually sell for a little less per pound than the round. The remainder of the lean can be used for hamburg, or rolled for a boiling piece.

KIDNEY KNOB.—This cut should be taken out next, leaving enough fat on the under side of the backbone to cover the tenderloin muscle. Next separate the loin and round at 14 to 15. This seems to be about the most difficult cut for most people. A great many open the hindquarter from the meat side; that is, with the bone side down. The following directions will take away all of the guesswork in opening a hindquarter:

Lay hindquarter meat side down. Begin at 18, where the backbone starts to rise toward the tail, and count four bones from point 18 to point 15, thus leaving four bones on the loin, C. Cut from this point, 15, on a line about one inch in front of the aitchbone, 17 to 14. Be sure the aitchbone has been split in the center. Your cut should look like the one in Fig. 67, 15 to 14.

Fig. 69.—Short loin, showing club steak.

Loin.—C and D Make up the Loin. The short loin, D, can be cut into steaks, club steaks coming from the rib end, or from line 1 to 3 (*see* Fig. 69). The club steaks do not contain any of the tenderloin muscle. They usually contain the thirteenth rib. A very popular steak. The porterhouse steaks are cut from the other end, or line 18 to 19 (*see* Fig. 70). The porterhouse steaks extend as far forward as the tenderloin or "filet" of beef. The tenderloin is the little tender muscle

which lies just under the backbone. It extends from the hip joint to near the thirteenth rib. Thickest near the forward end of the hip bone. The porterhouse is one of the most attractive and most expensive steaks in the carcass. It contains a T-shaped section of the backbone, a large triangular lean portion above the bone and a section of the tenderloin below the bone. It also contains a strip end of rather poor quality which contains a

FIG. 70.—Short loin, showing porterhouse steak. A, tenderloin muscle.

large amount of connective tissue and is cut with the grain of the meat. When this strip end is cut off, the steak is called a "short cut" porterhouse. The "T" bone steak is just like the porterhouse except that it does not contain the tenderloin muscle. From this point to the club steak, the steaks are spoken of as "T" bone. Any of the steaks from the hip bone to the rib may be called "T" bone, because they all contain this "T" shaped bone.

The loin end, C, is cut into sirloin steaks. (*See* Fig. 71.) The sirloin steaks are rather oblong in shape and con-

tain a large amount of connective tissue, fat and bone. They contain a small amount of tenderloin. A large portion of the lean must be cut with the grain of the meat. Not an economical cut. They are sometimes named as follows: Beginning at hip joint and cutting forward to point of hip bone: butt end sirloin; wedge bone sirloin; round bone sirloin; flat bone or double bone sirloin; hip bone or pin bone sirloin.

FIG. 71.—Loin end, showing sirloin steak. A, tenderloin muscle.

Rump.—The rump is separated from the round on line 16 to 17, which lies just below and parallel to the pelvic arch. It is usually used as a roast, either boned and rolled, or with the bone in. (*See* Fig. 72.)

Round.—The round is usually cut into steaks, but may be used as a roast. The rounds from thin cattle are usually cut into three pieces for dried beef. The flesh on the front part of the leg is known as the knuckle. The large muscle on top of the round, or on the inside of

the leg, is known as the inside or top (A in Fig. 73). This is the most tender part of the round. The bottom of the round, or the outside of the leg, is known as outside or bottom (B in Fig. 73). The three pieces, inside, outside, and knuckle are known as a dried beef set.

Boneless Cuts.—Sometimes thin carcasses are boned out, and then the round, A, is known as a dried beef set,

FIG. 72.—Rump of beef.

the rump, B, is known as rump butt, and the loin end, C, is known as "sir butt," or boneless butt. The short loin, D, is called "boneless strip." The tenderloin muscle, which lies on the lower side of the porterhouse steak, is pulled out and known as "tender" or "filet" of beef. The prime rib, when boned, is known as a "Spencer roll," if it contains a small amount of fat. If it has practically no fat at all, the top strip is taken off and the cut is then known as a "regular roll." The entire plate

may be boned and rolled and is known as "roll boneless." The large muscle lying in the angle made by the shoulder blade and the arm of beef can be pulled out and is known as a "Shoulder Clod." When the blade bone is lifted and the large muscle between it and the neck bone is cut out it is known as the "Scotch clod," or "C shoulder." If not trimmed it is spoken of as boneless chuck.

FIG. 73.—Round of beef. A, inside of leg or top of round; B, outside of leg or bottom of round.

Essentials in the Selection of Beef Cuts.—All of the factors considered in the judging of beef carcasses should be considered here and in addition the palatability and economy of the various cuts. The nutritive value of the lean portions of the various cuts from a side of beef are about equal. This may vary, however, in different animals, depending upon the amount of fat included in the lean portion.

Palatability.—The palatability depends upon the tenderness, the proportion of fat to lean, flavor, odor, juici-

TABLE IX

TABLE PUBLISHED BY ARMOUR AND COMPANY * SHOWING THE PERCENTAGE OF PRODUCT WHEN THE CARCASS IS BONED

		Per Cent
ROUND	Inside	33
	Outside	19
	Knuckle	16
	Trimmings	2
	Shank Meat	9
	Shank Bones	17
	Regular tallow	3
	Edible Scrap	1
		100

		Per Cent
FULL LOIN	Tenderloin	13
	Sirloin Butt	22
	Sirloin Strip	23
	Suet	7
	Bones	22
	Trimmings	13
		100
FULL PLATE	Boneless Plate	71
	Bones	29
		100

		Per Cent
FLANK	Trimmed Flank	67
	Flank Steak	17
	Regular Tallow	4
	Scrap Tallow	12
		100

		Per Cent
SQUARE CUT CHUCK	Boneless Chuck	62
	Clods	16
	Bones	22
		100

		Per Cent
RUMP BUTT	Boneless Rump	88
	Tail Bone	12
		100
RIB	Spencer Roll	41
	Trimmings	30
	Bones	29
		100
FORE SHANK	Shank Meat	55
	Bones	45
		100

ness. Tenderness of the raw beef can best be judged by the general appearance of the meat and bone. The lean should have a bright red color and present sort of a firm, velvety appearance. The muscle fibers should be of fine texture and well interspersed with fat with a

* Armour's Fresh Beef Cuts.

minimum amount of gristle. Reddish colored, soft bones indicate a young animal, and the meat is usually more tender than where the bones are hard and white as they are in older animals.

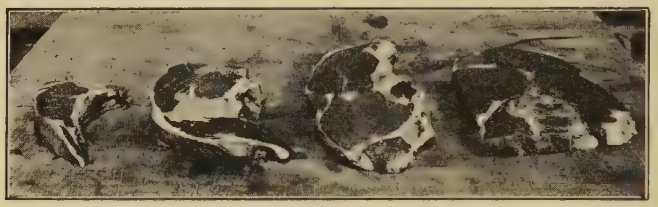

FIG. 74.—Steaks. (Left to right) club steak, porterhouse steak, sirloin steak, round steak.

The method of caring for the beef from the time it was slaughtered until it reaches the table has a great influence on the flavor and odor. Beef should never be kept in a foul smelling ice box, or where vegetables are

FIG. 75.—Prime ribs of beef. Left, showing too much fat; center, proper amount of fat; right, not enough fat. The amount of lean meat is practically the same in all three.

kept in the box. Beef will not ripen or age properly in an ice box without plenty of ventilation and a temperature just a little above freezing.

Juiciness is closely associated with flavor. The juice is the liquid extract which comes from the muscle fibers

and which adds so much to the flavor. A well marbled, tender piece of beef is usually juicy.

Economy.—The relative economy of the various cuts depends almost entirely on the amount of lean, fat, and

FIG. 76.—A fancy prime rib.

bone, and the price per pound. It depends to a certain extent on the cost of preparation and the quantity necessary to satisfy the consumer.

The following tables are taken from Bulletin 158, University of Illinois:

TABLE X

AVERAGE PERCENTAGES FOR THE CUTS TAKEN FROM THREE STEERS

		Age	*Live weight*	*Dressing, per cent*
1.	Grade Hereford	18 mo.	902	60.36
2.	Grade Aberdeen-Angus	24 mo.	1190	60.88
3.	Pure bred Shorthorn	29 mo.	1360	63.97

The differences in breeds, ages and weights give good average percentages on the cuts.

TABLE XI

PERCENTAGES OF LEAN, VISIBLE FAT, AND BONE IN THE REGULAR WHOLESALE CUTS, ALSO NET COST PER POUND OF LEAN AND TOTAL MEAT—

Wholesale Cut	*% Lean*	*% Fat*	*% Bone*	*Total*	*Wholesale price per lb. of cut, cents*	*Cost per lb. of lean in cut, cents*	*Cost per lb. of total meat in cut, cents*
Loin	58.53	31.75	8.89	99.17	18.5	31.6	20.5
Rib	55.21	30.17	14.18	99.56	15.0	27.1	17.5
Round	64.61	18.03	16.63	99.27	11.5	17.8	13.9
Chuck	69.47	18.63	11.26	99.36	9.5	13.7	10.8
Plate	50.61	40.73	8.47	99.81	8.0	15.8	8.7
Flank	36.30	63.18	.25	99.73	8.0	22.0	8.0
Fore Shank.	47.61	11.63	40.20	99.44	5.0	10.5	8.4
Kidney suet & kidney.	7.01	92.99	0.0	100.00			
Entire Side.	56.90	30.29	12.34	99.53			
Hind quarter	54.42	34.55	10.71	99.68			
Fore quarter	59.12	26.69	13.73	99.54			

It will be noted from a study of the above figures that food values of beef cuts do not correspond to their wholesale market price. The cheaper cuts are more economical sources of both lean and fat.

TABLE XII

THE AVERAGE PERCENTAGES OF THE WHOLESALE CUTS IN THE THREE STEERS MENTIONED ABOVE

	Average per cent
Loin	16.76
Rib	9.77
Round	21.78
Chuck	21.89
Plate	15.63
Flank	5.15
Fore Shank	4.97
Kidney Suet	4.06
	100.00

TABLE XIII

THE AVERAGE PERCENTAGES OF WHOLESALE CUTS TO CARCASS WEIGHTS ON VARIOUS CLASSES OF CATTLE AS GIVEN BY BULLETIN 147, UNIVERSITY OF ILLINOIS

	Loins	*Ribs*	*Rounds*	*Chucks*	*Plates*	*Flank*	*Shank*	*Suet*
Extreme Range	15-19	8-11	20-26	21-27	12-16	2-5	3-7	2-7
Conventional Average....	17	9	23	26	13	4	4	4

FIG. 77.—Corned beef.

Hamburg.—For hamburg, use all of the lean trimmings, such as the diaphragm muscle, the hanging tenderloin, which is located on the backbone, line 1 to 3

passing through the cut, and any other parts of the carcass for which you have no other use. Grind and mix with following formula:

50 lbs. beef.
1 lb. salt.
3 oz. pepper.

Corned Beef.—Any part of the beef carcass can be corned. The brisket, navel, and rump are often used in this way. Cut in five or six pound chunks and rub with

Fig. 78.—Dried beef set.

salt. Pack in a clean vessel of hardwood or stone and cover with the following pickle or brine:

1½ lbs. salt.
1 oz. saltpeter.
¼ lb. sugar or syrup.
1 gal. water.

This will be cured in about two weeks and can be used out of the brine. If it stays in the brine a month or more, it should be parboiled. A light smoke improves the flavor of Corned Beef.

Dried Beef.—The beef rounds are usually dried and the clod is sometimes used also. Use the same pickle as

for corned beef. Allow each piece to stay in the brine about three days to the pound, hang up, and allow it to drip about 24 hours. Give it a light smoke and hang in a warm place to dry.

Wieners.—Fresh or cured beef alone makes a splendid product when finely ground, seasoned, and stuffed. It

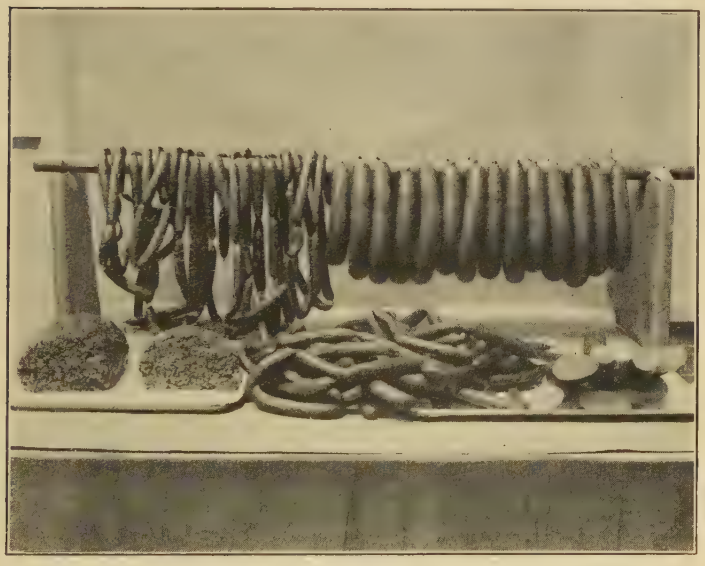

FIG. 79.—Wieners and bologna.

is better to use fresh meat, about half lean beef and half lean pork. For every 50 pounds of fresh meat use one pound of salt, two ounces of pepper, one half ounce of nutmeg, and about one gallon water. Grind very fine and mix with seasoning and water. Stuff into either sheep or hog casings. Make into three and one half inch links by twisting every other link two or three times. Hang them in the smoke house so that the links are hang-

ing separate. Smoke with hardwood for one hour. Cook for about twenty minutes in water 160° F. If the wieners are not all floating at this time they should be left in a little longer. Do not have the water much hotter than 160° or you may burst the casings. They should then be rinsed in hot water to remove any grease from the outside of the casings. Wieners should be used soon after they are made.

Bologna.—The same formula may be used for both wieners and bologna, except that the bologna is usually stuffed in beef casings. A different flavor may be obtained by using three fourths beef and one fourth pork. Use the same proportions of salt, pepper, nutmeg, and water. One half ounce of finely ground coriander will improve the flavor. Mix thoroughly and stuff tightly into beef rounds. Tie each end of the rings. Each ring should weigh about one pound. Smoke about two hours and cook thirty minutes or until they float in water not over 160° F. Rinse in hot water to clean off any grease.

Using Beef Fat.—A small amount of beef fat can be added to pork fat for making lard. It can also be utilized to good advantage in making soap.

CHAPTER VIII

THE SELECTION, DRESSING, AND CUTTING OF VEAL

Veal is quite a popular meat. About half as many veal calves as mature cattle are killed each year in our larger packing houses.

The very best veal is produced by allowing the calf to suckle the dam. The calf should be allowed to suckle the dam for about six to eight weeks, and, if of good beef type, should be well finished at this time and weigh about one hundred and fifty pounds. It should dress about 70 per cent or a 105 pound carcass. The veal calf should conform strictly to the beef type. The veal calf that is suckling the dam should not be kept off feed for twenty-four hours, because the calf will worry and fret itself into an abnormal condition and the meat will be in much worse shape than if the calf would be killed just off of full feed. The calf may be kept off feed for about six hours without harm. The meat will not be cured or ripened as in the case of beef, so that it is not so important to keep them off feed for such a great length of time. The carcass from an excited or overheated veal will soon spoil.

The veal calf is usually dressed with the hide on and great care should be taken to select a clean place to do the killing, so that the hide will not become soiled.

Methods of Killing and Skinning.—The calf should be stunned and bled in the same manner as the beef.

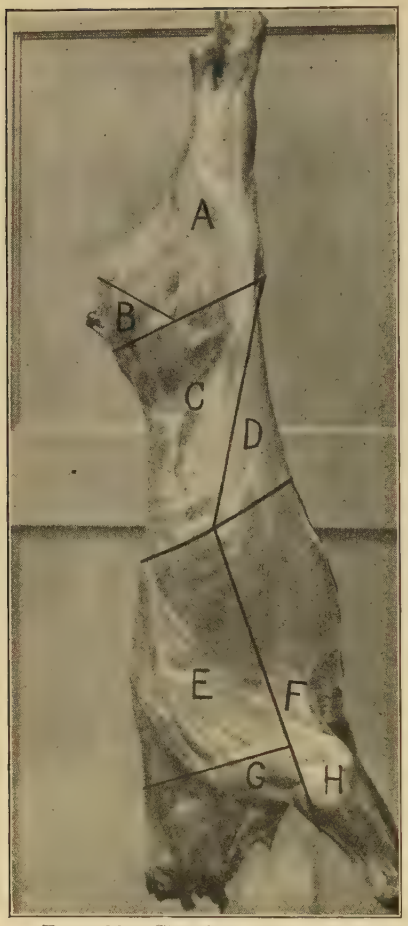

FIG. 80.—Showing cuts of veal. A, leg—cutlets and roast; B, rump —roast; C, loin—steaks or chop and roast; D, flank—stew; E, hotel rack or ribs—chops and roast; F, breast —stew; G, shoulder—roast chops and stew; H, shank—stew; A, B, C, D, hindquarters or saddle; E, F, G, H, forequarter or market rack.

They are quite often bled like a sheep. *See* Chap. X. The head and shanks are skinned out, and the hide left on. The internal organs are removed exactly as in the beef animal. The hide is left on, to protect the carcass from drying out. The carcass may be skinned out as it is used. If you want to use a hindquarter, skin it out, and leave the hide on the rest of the carcass.

A veal set is prepared from the head and shanks by cutting them off without skinning. Then scald the hair off and scrape clean. This is found in larger markets.

Cutting the Veal Carcass. — The veal carcass is quartered between the twelfth and thirteenth rib. (*See* Fig. 80.) The

hindquarter is spoken of as the saddle or hind saddle. The round is cut into veal cutlets, and the loin and rump into veal chops. The flank is used for veal stew. The forequarter is sometimes spoken of as the market rack or fore saddle and is cut into chops and veal stew. The cuts on the forequarter are made just as they are on the beef forequarter, except that the parts used for beef roasts are cut into slices for veal chops and the parts used for boiling beef are used for veal stew.

Judging Veal Carcasses.—The value of the veal carcass depends upon its form, quality, and weight.

Form.—The neck should be full and short, the shoulders smooth, ribs well covered, wide across the top of the ribs and across the loin. The round should be as plump and full as possible.

Quality.—The color should be a pale pink, almost white, and uniform throughout. The bones should be red, soft, and fine. The fat should be a clear white. The meat should be fine grained and free from spots and coarseness.

Finish.—Well finished calves are the most desirable. If the calf lacks finish, the carcass dries out rapidly and soon becomes discolored. No intermixture of the fat and lean is found in the veal carcass.

Weight.—Weight is important because it is usually a very good indication of the finish and age. Weight and

TABLE XIV

GRADES OF CARCASS VEAL *

Grade	*Extreme Weights*	*Weight of Bulk*
Choice	80–120	90–100
Good	70–130	75–95
Medium	60–160	65–80
Light of Common	40–75	50–65
Heavy	150–300	160–200

* Ill. Bull. No. 147.

age are the most important factors in grading veal carcasses.

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PART THREE

LAMB AND MUTTON

PART THREE—LAMB AND MUTTON

INTRODUCTION

Lamb and mutton are rapidly coming into their own as popular meats, both in the city and on the farm. When farmers awake to the fact that lamb and mutton are just as palatable, practically as great in nutritive value, and just as easily dressed as beef and pork, a great deal more of this meat will be consumed on the farm.

Heretofore lamb has been considered somewhat of a delicacy, to be killed only by experts and consumed by the wealthier class of people. This is due to several causes.

1. For many years the strictly wool type of sheep constituted the majority in this country, and their carcasses did not produce a really high-class meat product.

2. Mutton and lamb do not cure so satisfactorily as pork or beef, and hence are used more as a fresh meat product.

3. Many people have a prejudice against the taste of mutton and lamb. This has been brought about partly because of improper handling of the meat and partly because every one emphasizes the fact that mutton should always be eaten with mint sauce or something to take away the mutton flavor. If people would forget about the mint sauce and eat roast lamb as they do roast pork, Americans of the next generation would be consuming as much mutton and lamb as beef and pork. The taste

for lamb must be cultivated as the taste for pork and beef has been.

4. There is lack of information on the part of the farmer and small butcher as to the best methods of dressing and cutting mutton and lamb. This quite often results in a poorly flavored product.

Lamb and mutton may profitably be used to a greater extent on the farms by the American people.

The mutton type of sheep is rapidly becoming popular on the small farms as well as on the western ranges of the United States.

The small carcass lends itself well to the use of one family. The cuts are small and can be easily utilized while fresh.

Lamb and mutton are just as easily digested as either pork or beef.

Reports from the Bureau of Animal Industry show that fewer lambs are condemned under government inspection than any other class of meat animals. The sheep is more particular about its feed than any of our other meat animals.

Sheep can be just as easily killed and can be dressed in less time and with less equipment than any other domestic meat animal.

CHAPTER IX

SELECTION OF THE SHEEP FOR BUTCHERING

Health.—Always select thrifty, healthy looking sheep. If they have been feeding all right and look thrifty, the chances are very good that the carcass will be free from disease of any kind.

Condition.—Animals should be in medium condition, evenly covered with a firm, white fat. A carcass of lamb or mutton requires less fat in proportion to the lean, to render it juicy and palatable, than any other class of meat. The muscles of the very thin sheep are often tough and lack flavor, while the overfat animal is very wasty. Lambs very seldom become too fat.

Age.—Lambs should not be killed under eight weeks of age. The meat from the very young lamb is too watery and lacks flavor. Sheep over twenty-four months old often produce coarse grained, very dark red, poorly flavored meat. Lambs at four or five months furnish excellent meat.

Breeding and Type.—Lambs of the mutton breeds will furnish the best grade of meat. The mutton type sheep will always furnish a better intermixing of fat and lean, and they are not so apt to be patchy.

Quality.—The very best fine grained meat is produced by the smooth, fine boned animal. Coarse shoulders and an angular build show lack of quality and are indications of a wasty, poor grade carcass. The skin

should be of a bright pink color and free from dark colored spots. A white or bluish colored skin is quite often found in an unhealthy animal. The high quality animal will produce a carcass that will cut with a minimum amount of waste.

Dressing Per Cent.—The dressing per cent of lamb and mutton depends upon (1) the weight of the pelt, (2) condition or fatness, (3) paunchiness, and (4) type. Anywhere from 3 to 30 pounds of wool may be clipped from a sheep's back so that you can readily see how this would influence the dressing per cent of a 150-pound sheep. This factor is not so important with sheep as it is with cattle and hogs, on account of the higher value of the offal, especially the wool. The fat, well finished lamb will always dress higher than a lamb in poor condition. Paunchiness may influence the dressing per cent from 3 to 8 per cent, depending upon the fill. Mutton type sheep generally dress higher than the strictly wool type on account of the heavier pelt of the latter, and they are usually lower in condition.

Sheep may dress from 40 to 69 per cent, but ordinarily they will dress from 45 to 55 per cent.

The following tables show the dressing percentages of the prize lambs and muttons in the carcass contest at the International Live Stock Exposition for 1920-21. These were all prime sheep:

TABLE XV

Dressed Carcasses of Yearling Wethers

1920

Prize	*Live weight, pounds*	*Dressing, per cent*
1	134	59.
2	131	57.30
3	117	56.40

DRESSED CARCASSES OF LAMBS

1920

Prize	*Live weight, pounds*	*Dressing, per cent*
1	94	54.30
2	101	57.40
3	87	52.90

DRESSED CARCASSES OF YEARLING WETHERS

1921

Prize	*Live weight, pounds*	*Dressing, per cent*
1	108	57.41
2	109	55.05
3	129	57.36

DRESSED CARCASSES OF LAMBS

1921

Prize	*Live weight, pounds*	*Dressing, per cent*
1	98	53.06
2	105	57.14
3	94	57.45

CHAPTER X

KILLING AND DRESSING SHEEP

Handling the Sheep Before Slaughter.—Sheep should be kept off feed for at least 24 hours before slaughter. Plenty of fresh water should be allowed during this time. Young lambs should not be separated from their mothers quite so long, because they will worry and fret too much. Sheep should be handled just as carefully as possible; the animal should never be struck, or grasped by the wool, as this will leave a bruised spot and spoil part of the meat. If the animal is killed, just off of full feed, gases will form in the stomach and may influence the flavor of the meat. The fleece should be as dry and as clean as possible. Every precaution should be taken to keep the sheep quiet and free from bruised spots. The following directions are very simple, and satisfactory work can be done without an expert.

Tools Necessary for Killing.—First, have a clean, dry place to work. A few boards or an old door do very well to work on. A sharp butcher knife will be needed, a small, clean box to lay the sheep on while sticking, a bucket of warm water, some clean cloths and strong string or rope, and a convenient place to hang the carcass. A common meat saw is necessary for cutting the carcass.

Methods of Killing.—

Stunning with Hammer.—A blow on the forehead will stun the sheep so that the sticking may be done without its struggling so much.

Bleeding.—This is the most satisfactory method, because you are always sure that the carcass will bleed out well.

Sticking.—A right-handed man should lay the sheep on its left side on a clean box, so that the fleece may be kept clean and the animal cannot get a foothold when struggling. Grasp groove in lower jaw at end of muzzle

FIG. 81.—Sticking.

with left hand, and place left knee just back of the head, with your right knee in fore flank. Draw the head back against your left knee, stretching the neck. Stick the knife into the neck at the base of the right ear in the angle made between jawbone and neck. Hold back the edge of knife nearest neck bone, cut through the neck as near the neck bone as possible. (*See* Fig. 81.) The neck can be broken or the sheep stunned by pulling the

muzzle back against your left knee. Be sure to lay your knife down where the sheep cannot reach it in struggling.

Skinning.—When it is thoroughly bled out, lay the sheep down on its back. Stand with your feet near the middle and facing the head of the animal. Your foot will help to hold the sheep on its back. Place front foot

Fig. 82.—Opening pelt over knee.

of sheep between your knees, and grasp the pelt at the knee joint. Open the pelt over the front side of the knee and loosen a strip down to the fetlock or ankle joint. (*See* Fig. 82.) Then open the pelt from the knee down to a point about six inches in front of breast bone. An opening is all that is needed.

When opening the pelt in this way, hold the knife rather flat, with the point up against the under side of

the pelt. (*See* Fig. 83.) Be very careful not to cut or tear the fell, which is the thin white membrane between the pelt and the carcass.

Open the other fore shank in the same manner as the first. Turn around and place one hind foot of the sheep between your knees, and grasp the pelt at the point of

FIG. 83.—Opening pelt from knee to neck. Note method of holding the knife to prevent cutting the fell.

hock, open the pelt over the point of hock and loosen a strip down to hoof. (*See* Fig. 84.) Open the pelt from the hock down to the rectum. Then remove the hind foot at lower pastern joint, and loosen the pelt on the hind shank from the hock toward pastern joint. Use a knife to open the tendons from back of the hind shank.

Wash your hands clean. Grasp the triangular strip of

pelt in front of the brisket, and fist the pelt loose from the brisket. The pelt should be fisted loose on each side of the brisket. Then place your foot on the neck of the sheep and pull up on the triangular piece of skin and it will tear loose from the brisket. It may be necessary to use a knife just a little if the meat starts to tear.

FIG. 84.—Opening pelt from hock to rectum.

Fist an opening just the width of your hand back to about the middle of the underline. Next start at the rectum. Lift the triangular piece, and fist opening the width of your fist along the underline to meet the opening made from in front. (*See* Fig. 85.) It is well to loosen the pelt over the cod or udder at this time. Care must be taken to keep the thumb next to the pelt in fisting from the cod forward, or the fist may tear the flank

and open the abdominal cavity. Be very careful not to pull the pelt from the hind foot down toward the leg, or the fell will tear from the leg.

Tie hind shanks together and hang on a strong hook. (*See* Fig. 86.) Open pelt down the opening made along the underline. (*See* Fig. 87.) Begin fisting in the mid-

FIG. 85.—Fisting pelt loose from between the hind legs.

dle of the underline (*see* Fig. 88), and fist over hind flank and legs on both sides, leaving the pelt attached at the tail and along the middle of back. (*See* Fig. 89.) Start at the middle again and fist down over the fore leg (*see* Fig. 90), and remove the toes at break joint, which is located just above the fetlock joint. (*See* Fig. 91.) This joint will not break on the older sheep, but can easily be broken on a lamb.

Loosen the pelt from tail and pull pelt straight back from the carcass; it should strip down the back to the neck.

Pull down over head as far as possible and cut head off just back of ears, or at opening made in sticking animal.

FIG. 86.—Hind shanks tied together and opening fisted along underline. Ready to hang.

Open the neck from breast bone downward, separate and loosen the windpipe and gullet and tie gullet.

The carcass should be thoroughly cleaned with a hot, damp cloth. Do not wash the carcass unless it is very dirty.

Gutting.—Cut around the rectum, and loosen the bung gut so that it can be pulled out from the back at least two inches, and tied. Make opening just below

cod or udder and open carcass down the midline about half way to the breast bone. It is well to remove the caul fat at this time (*see* Fig. 93), in order to be sure that it is clean.

Pull the large intestines down, being sure to get the bladder at the same time, and being careful not to disturb the kidneys or kidney fat. Pull out the stomach, intestines, and liver. The gullet should not be cut from the stomach, but pulled up through chest cavity, which can easily be done if it has been properly loosened when the head is removed and neck opened.

FIG. 87.—Opening pelt down opening made along underline.

Remove the gall bladder from the liver and cool the liver as soon as possible.

FIG. 89.—Fisting up over hind flank and leg.

FIG. 88.—Beginning at the middle to fist the pelt loose.

FIG. 91.—Removing the forefoot at the "break joint."

FIG. 90.—Fisting down over foreleg.

FIG. 92.—Shank bones showing round-joint and break-joints. Left, true break-joint; center, break-joint broken with pincers—too old to break properly; right, round-joint taken off at fetlock joint—A, round or fetlock joint; B, location of break-joint; K, knee.

Use a knife to cut down just a little to one side of the center of the breast bone and remove heart and lungs.

Bend the fore shanks back at the knee, and pin them up with a clean nail or a wooden pin. This improves the appearance of the carcass. Wipe the carcass clean with a warm, damp cloth.

If the weather is warm, the carcass may be cooled more quickly by splitting down the center of the backbone with a saw, just as you would a beef or a hog, cutting the carcass into halves. Hang in a clean, cool place to cool out.

The head should be skinned out from the pelt. Remove the brain and tongue. The pelt should be salted and cured. (*See* chapter on curing and tanning hides.)

Methods of Dressing.—The above method of dressing both lamb and mutton is known as the plain or round dressed carcass. This is the only one in use to-day. Prior to the World War several different methods were used. The "caul dressed" lambs had the caul fat, a fatty membrane attached to and surrounding the stomach, wrapped around the hind legs and body. This prevented the body from drying out, and improved the appearance. This was discontinued during the war because, in a great many cases, the caul fat would either spoil or be discarded.

"*Pelt on.*"—Lambs were sometimes dressed with the pelt on. This has been practically discontinued because the wool came in contact with the open carcass. Carcasses should always be chilled out in a clean room which is free from all odors. The presence of the wool in the cooler does not improve the flavor of the meat.

"*Pluck in.*"—The liver, heart, lungs, and windpipe are known as the "pluck." Formerly lambs and mutton were dressed without splitting the breast bone and the

FIG. 93.—Gutting and removing caul fat.

pluck remained in the carcass. In a great many cases the pluck would spoil before it could be utilized.

Hot House Lambs.—Sometimes spoken of as "Winter" or "Incubator" Lambs. Young lambs in season

from Christmas to April, fed especially from birth for a fancy hotel trade. Sometimes shipped to hotels, restaurants and clubs alive and sometimes dressed "pelt on." They vary in age from five to eight weeks and in weight from 20 to 45 pounds.

Sheep Carcasses.—The sheep carcass is quite often sold on the market in one piece. It is sometimes divided into Saddle and Rack, leaving one rib on the saddle. The Saddle and Rack usually weigh about the same. The saddle is sometimes a little the heavier and from 15 to 25 per cent more valuable per pound. The rack is just as palatable as the saddle.

Classification and Grading of Carcasses.—The carcasses are classified as follows on the Chicago market: Lambs, Yearlings, Wethers, Ewes, and Bucks. The market classes are based on differences in sex and age. Each of the above classes is graded according to form, quality, covering, weight, and age.

Form.—A well balanced, compact, smooth carcass is desired. Emphasis should be placed on the development of the higher priced cuts. The legs, loin, and rib should be well developed. The neck and legs should not be long, and the neck should not be too heavy.

Quality.—Quality refers to the degree of fineness of the bone, texture of the meat, and color of the lean and fat. There should not be a high per cent of bone to meat. The flesh should be fine grained and not coarse and stringy. The color of the lean varies from a light pink in the young lamb to a dull red in the mature sheep. The fat should be white. The lamb and mutton carcasses should be made as attractive in general appearance as possible.

Covering.—A smooth even covering of fat is desired. This is important not only from the standpoint of ap-

pearance and palatability, but from the standpoint of shrinkage in storage and cooking. The legs should be well covered because this is a good indication that the rest of the carcass is well finished. A well developed kidney is another good indication of a well finished carcass. The kidney development should not be excessive. The covering of fat should be firm and brittle. An excessive covering is always wasteful.

Weight.—Weight is important because it is often a strong indication as to whether a carcass is a lamb, yearling, or a mature sheep, and also as to how well it is finished. Lamb carcasses may run from 15 to 50 pounds, while the more mature carcasses sometimes go as high as 200 pounds. The most desired weights for the lamb carcass is from 35 to 45 pounds. These lighter carcasses are always in greater demand.

Age.—Lamb carcasses are always in greater demand than mutton carcasses. Nothing over one year old should be considered as lamb. The maturity of the carcass may be determined by the bones. Where the breast bone has been split, the bones will show up red and rather soft in the lamb. They will be white and hard in the older sheep. The break-joint is a temporary cartilage in the shank bone just above the ankle. This joint is always broken whenever possible. In lambs, there is a distinct saw tooth appearance. (*See* Fig. 92.) The broken surface is pink and smooth in the lamb, while in the older sheep it is porous and almost white in color. The shanks of mature sheep will not break smooth at this joint because the cartilage has turned to bone. The bone may be broken with a pair of pincers at this point, but the broken surface will be rough and jagged and white in color. The female or ewe sheep matures faster than the male, and this cartilage turns to bone at a younger age.

IOWA STATE COLLEGE
DEPARTMENT OF ANIMAL HUSBANDRY
Meat Laboratory
Students' Score Card

LAMB AND MUTTON CARCASSES

	Scale of Points	*Perfect Score*
1.	AGE—Lamb five to twelve months. Mutton one to two years. Lamb should show break joint	15
2.	WEIGHT—36 to 40 pounds for lambs; extreme range 15 to 50 pounds. Mutton 55 to 65 pounds. Extreme range 50 to 200 pounds	20
3.	SHAPE OR FORM—Compact, well developed over back, loin and leg. Smooth shoulder	25
4.	QUALITY—Fine bone, clear white, flaky fat, firm flesh, fine grained, not stringy. Light pink color in lambs, darker red in mutton. Attractive in appearance	20
5.	COVERING—Smooth even covering of medium thickness ¼ to ½ inch for lambs and ½ to ¾ inch for mutton. Avoid excessive covering of fat	20
	TOTAL	100

Name ..... Date .....

Aging or Ripening Lamb and Mutton.—Lambs and mutton improve by ripening or aging. The carcasses should hang from one to two weeks before cutting. The meat becomes more tender and more palatable after aging in the cooler or during cool weather. A little mold on the outside of the carcass will not detract from the flavor.

CHAPTER XI

CUTTING LAMB AND MUTTON CARCASSES

Tools.—A sharp knife, a good saw, and a clean, strong table or bench are all of the tools and equipment necessary for cutting the carcass. Much better work can be done if the carcass has been thoroughly cooled out. The various cuts may be made either before or after splitting down the backbone. (*See* Fig. 94.)

Rack.—If you desire to cut English chops, the cuts must be made before the carcass is split. Lay the carcass on one side with the meat side up. Make cuts 1, 2, 3, 4. The flank F is removed, and may be used for stew. The breast and fore shank, E and C, are known as mutton or lamb breast or plate, and are generally used as stew meats or stuffed breast of mutton or lamb. The pocket is made by separating the muscles at the brisket end of the plate so as to form a place for the stuffing.

Shoulder.—For the shoulder, cut 5 to 3 is made, leaving two or three ribs on the shoulder, B. The neck, A, may then be cut off to square up the shoulder. The neck is usually cut into small pieces for stew. The shoulder may be cut into chops as in Fig. 95, or it may be boned (*see* Fig. 96) by removing ribs and neck bone, 1, then cutting into shoulder joint and removing arm bone, 3, then removing shoulder blade, 2, by loosening the meat around the bone and pulling the blade out, tearing the feather bone on the blade loose from the meat. Remove the fell from the outside and roll shoulder so that it may

be sliced across the grain of the meat, and tie as in Fig. 97. This is the most attractive way to prepare the shoulder for roasting.

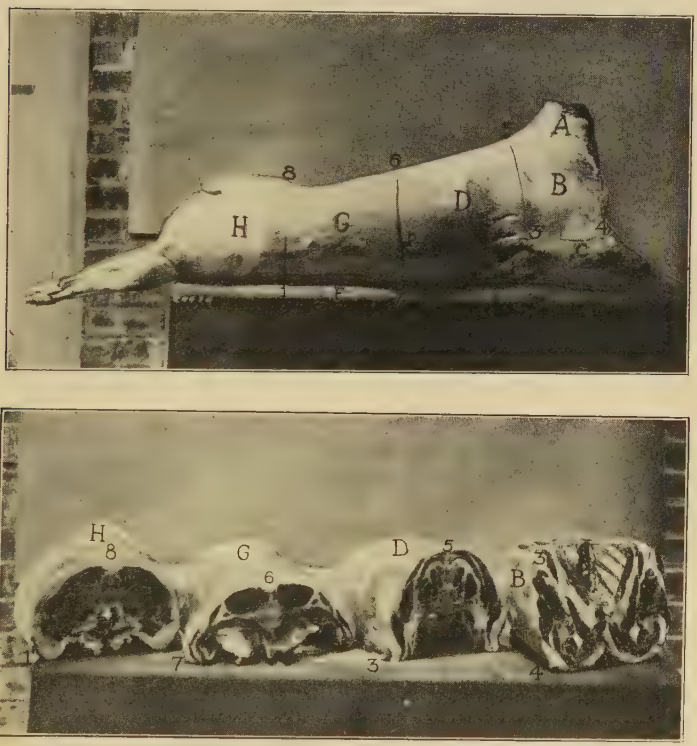

FIG. 94.—Carcass showing cuts. A, neck; B, shoulder; C, shank; D, short rack, hotel rack or ribs; E, plate; F, flank; G, loin; H, leg.

Ribs.—The short rack or Hotel rack or ribs, D, may be removed next by cutting on line 6 to 7, leaving one rib on the hindquarter to help hold its shape, in case it is not to be used at once. The ribs may be sliced into chops,

as in Fig. 98, the chops being made about one inch thick and including one rib. Or the ribs may be shaped into

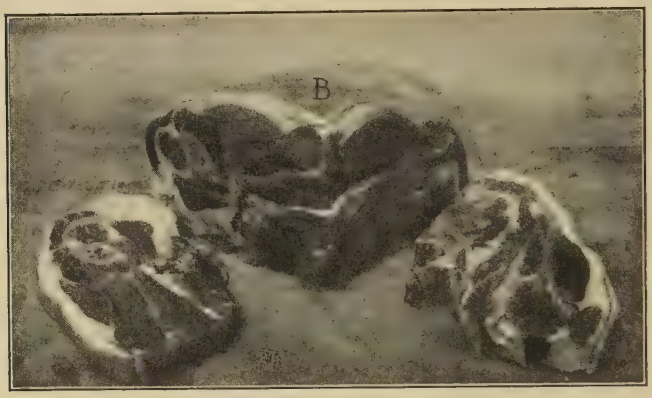

FIG. 95.—Shoulder steaks or chops.

a crown roast by cracking them apart along the backbone and sewing the similar ends of each piece together

FIG. 96.—Shoulder partially boned. 1, neckbone and ribs; 2, shoulder blade; 3, armbone just below shoulder blade.

as in Fig. 99, and then sewing the other ends together and peeling some of the meat down from the rib ends.

FIG. 97.—Shoulder boned and rolled, showing Saratoga chop.

FIG. 98.—Rib cut. Showing rib chop which has been "Frenched."

The crown roast thus made is one of the most attractive roasts in the carcass. (*See* Fig. 100.)

FIG. 99.—Sewing rib cuts together to make a crown roast.

Saddle. — The saddle or leg and loin may be separated on line 8 to 1, which can be made either in front of the hip bones or back of them, depending on the size of the roast preferred.

Loin. — The loin, G, may be used as a roast, or it may be sliced into English chops, as in Fig. 101, or it may be split and sliced into ordinary chops, as in Fig. 102. The chops should be cut about one inch thick and uniform in thickness.

FIG. 100.—Crown roast. Ready to serve.

Leg.—The leg of mutton or lamb, H, may then be trimmed up in a number of ways. The ordinary English style is to cut the hind leg off just above the hock; the French style is to trim a little of the meat off of the end of the shank bone, as in Fig. 103, and the American

FIG. 101.—English chop, cut from leg end of loin.

FIG. 102.—Loin chop, cut from loin after splitting along backbone.

style is to cut the hind shank off at the stifle joint, or the first joint above the hock, which makes the roast a little smaller for the roasting pan, but does not remove any of the roasting meat. Be sure to remove the fell from all of the cuts, as shown in Fig. 104. The leg and loin are usually considered the two best cuts of the carcass, and are always in demand.

Trimmings.—All clean trimmings should be used for

Fig. 103.—Leg of lamb, trimmed French style.

stewing. The heart and tongue may be pickled, and the liver either fried or boiled.

Essentials in the Selection of Lamb and Mutton Cuts.—The term lamb usually refers to a sheep under eighteen months, while the term mutton is applied to anything above that. Mutton has a smaller percentage of water and a larger proportion of fat, protein, and liquid extractives. Pound for pound mutton has a higher energy value than lamb. The nutritive value of mutton compares very favorably with that of beef. So far as digestibility is concerned, all meats compare quite favorably. Meats as a food are about 97 per cent digestible.

Mutton fats differ from other fat in that they have higher melting points and also higher solidifying points. According to tests carried on by the U. S. Department of Agriculture,* it was found that mutton tallow, which melted at 122° F., could be cooled down to 93° F. before it again became solid. Fat from the covering of the leg which had a melting point of 114° F. had a solidifying point of 89° F. The fat from the lean portion of the leg had a solidifying point of 77° F. A mixture of fats from the covering and lean portion of the leg had a melting point of 107° F. and solidified at 82° F. This would account for the fact that sometimes, when mutton and lamb are served, part of the fat on the platter may harden and part may remain liquid.

FIG. 104.—Removing fell from leg of lamb.

The lamb meat is more tender and juicy than mutton, and hence is becoming more popular than mutton. In selecting cuts from either lamb or mutton, the following factors should be considered:

Age.—Never select meat from a young watery carcass which is soft and flabby, or it will lack flavor. On the other hand, a cut from an old carcass will be tough and may be strong.

Soundness.—A carcass kept under poor refrigerating

* Farmers' Bulletin 526.

conditions will absorb foreign flavors and odors. The cuts should be attractive.

Tenderness.—A comparatively soft bone with a reddish color usually indicates a young animal, and the meat is almost sure to be tender. The lean should be a rich red color and should be fine grained. A well marbled piece of meat can usually be counted upon to be tender.

Fig. 105.—Lamb chop on left. Mutton chop from yearling wether, showing excess fat. Wasty. Note the similarity in the "eye," or size of the lean portions.

Flavor.—A proper intermixing of fat and lean is essential for a well flavored, juicy product. To be juicy, the cells must be rich in liquid extractives which impart the desirable flavor to lamb and mutton.

Economy.—The relative economy of the various cuts should also be considered.

Miscellaneous Recipes.—

Using Surplus Fat.—Any fats not used in cooking should be made into soap. The following formula will

TABLE XVI

THE RELATIVE VALUES OF THE CUTS AS THEY ARE PURCHASED AND ALSO OF THE EDIBLE PORTION ONLY *

Lamb—Fresh	*Refuse*	*Water*	*Protein*	*Fat*
SHOULDER:				
Edible portion		51.8	18.1	29.7
As purchased	20.3	41.3	14.4	23.6
LOIN, WITHOUT KIDNEY AND TALLOW:				
Edible portion		53.1	18.7	28.3
As purchased	14.8	45.3	16.0	24.1
LEG:				
Edible portion		58.6	18.6	22.6
As purchased	13.8	50.3	16.0	19.7
Mutton—Fresh				
SHOULDER:				
Edible portion		60.2	17.5	21.8
As purchased	22.1	46.8	13.7	17.1
LOIN, WITHOUT KIDNEY AND TALLOW:				
Edible portion		47.8	15.5	36.2
As purchased	14.8	40.4	13.1	31.5
LEG:				
Edible portion		63.2	18.7	17.5
As purchased	17.7	51.9	15.4	14.5

TABLE XVII

THE RELATIVE VALUES OF THE DIFFERENT CUTS

Wholesale Cuts	*Wts. in per cent*	*Price per pound* *Lamb cents*	*Mutton cents*
Leg	30%	26	21
Loin	20%	31	26
Hotel Rack or Short Rack	15%	36	32
Stew	35%	18	15
Saddle	51%	28	23
Rack	49%	23	18
Totals	100	27 average price	22½ average price

* U. S. Dept. of Agr. Farmers' Bulletin 34.

produce a very satisfactory product. Melt the fat and strain it through a cloth. To every six pounds of fat add one pound of lye dissolved in about two and one-half pints of cold water. This should not be mixed with the fat until both have cooled down to about 70° Fahrenheit. Stir as you mix and continue stirring until the material resembles thin honey. Do not stir too long. Pour into a granite or wooden vessel and, when sufficiently hardened, cut into squares and allow to ripen in the vessel for three or four weeks in order that the fat and lye may be completely united.

Fig. 106.—Left: leg of mutton from yearling wether, showing excess fat. Wasty. Right: leg of lamb. Lean portions about equal.

Corned Mutton or Lamb.—Any part of the carcass may be corned. Rub each piece with salt and cover with a brine of the following strength, and allow to remain in the brine about two weeks, when you can begin using it. If allowed to remain in the brine much more than three weeks it will probably need to be parboiled.

1 gal. water
1½ lb. salt
½ oz. saltpeter

Cured Mutton or Lamb.—Mutton or lamb may be either brine-cured or dry-cured. The leg is usually trimmed rather close at the loin end and used for curing. Rolled shoulders do very well, also.

Dry Cure.—Prepare enough of the following mixture so that a good heavy coat may be rubbed on each piece.

5 lbs. salt
2 lbs. sugar
½ oz. saltpeter

Rub thoroughly and allow to remain in the salt about 1½ days per pound per piece. A six-pound piece would stay in the salt about nine days. Brush salt off and hang in smoke-house about twelve hours. Then give a light smoke with either green hickory, maple, or corn cobs.

Brine Cure.—Use the same pieces as in dry cure. Rub each piece with a thin coat of salt, pack in a hardwood or stone vessel, and weight down. Cover the meat with the following strength brine:

5 gal. water
9 lbs. salt
2 oz. saltpeter

Allow each piece to remain in the brine about two days per pound per piece. A six-pound piece would stay in the brine about twelve days. Hang in the smoke-house and allow to drip for twenty-four hours. Then smoke as in the dry cure. Cured mutton or lamb will not keep quite as well as pork, but if kept in a dry, dark, cool place, the cured meat will keep until you have had plenty of time to use it.

CHEVON (GOAT MEAT)

Almost 150,000 goats are marketed each year and slaughtered under Federal inspection. When received in large numbers, the Angora wethers sell for about 60 per cent of the price of sheep wethers. Goats are dressed and the carcasses are cut into cuts in about the same manner as sheep. The average goat will not dress quite as high as the average sheep. The carcass is not quite so heavily fleshed as mutton carcass.

There is no Federal restriction on the sale of goat carcasses in competition with mutton. Quite often goat meat goes into the regular mutton trade. In many of our western towns, near the range or in the mining towns, the goat meat sells as readily as mutton. Quite often there is more demand for the goat meat on account of its lower cost. It is considered by some people to be much sweeter than mutton.

The meat from the Angora goat is quite different from that of the "brush goat."

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PART FOUR

MISCELLANEOUS

PART FOUR—MISCELLANEOUS

CHAPTER XII

PRESERVING MEAT WITHOUT CURING

Curing meat is one of the most common ways of keeping it for future use on the farm. Many people, however, prefer the fresh meat to the cured meat, so that some way other than curing must be devised for keeping it.

There are two methods of preserving meat without curing—by holding in cold storage and by canning.

Cold Storage.—This method is more common in the winter time. However, a great many farmers have refrigerators with a little ice machine attached, or they buy ice or have their own supply of ice, which is stored in an icehouse at some time during the winter. Meat can be kept almost indefinitely if it can be kept frozen solid, but this would be impractical on the farm. A community cold storage would be the best way to handle this. When meat is to be frozen, it should be cut into pieces about the size in which they are to be used. Then it is all ready to prepare for the table without further cutting. Freezing does not influence the nutritive value, or the palatability, if the meat is used as soon as it has thawed out. Meat must not be allowed to freeze and thaw or it will soon spoil. Freezing does influence the texture of meat to a certain extent by breaking down some of the cellular tissue. Meat can be kept in cold storage without

freezing for quite a long time, if kept in large pieces. Beef can be kept for thirty to forty days at a temperature of 34° F. Beef should be well covered with fat if you expect to keep it any length of time in cold storage without freezing because the fat protects the lean and does not mold so much. The meat will have some mold (whiskers) on it even at fifteen days, but this only tends to improve the flavor. The outside must be trimmed off before using. This is not practical with small cuts of meat because they cannot be trimmed sufficiently to get rid of the moldy taste. If steaks are to be kept in cold storage several days after they are cut, they should be piled up with a piece of heavy paper between each steak. This will help to hold the color and keep the steak from drying out by holding the juice in.

Mutton which is well covered with fat can be held fifteen to twenty days. The flavor of mutton will change more than in the case of beef. Pork will develop a stale flavor much more quickly than either beef or mutton. If pork is held over ten days, it is not nearly so palatable as fresh pork.

Great care must be exercised in holding fresh meat in cold storage because meat will absorb any flavors quite rapidly.

After the meat has been kept in cold storage as long as possible, it can be cooked and then held in storage almost another week.

Canning Meat.—This method is quite extensively practiced on a great many farms and, to a certain extent, in some of our city homes, when a larger quantity than the average purchase can be secured at a reduced price. This will be practiced more extensively on the farm and in the city when more people become acquainted with the canning process. When the canning is properly done

there is absolutely no danger of the meat spoiling, and it is always ready to be prepared on short notice, and tastes exactly like fresh meat. The housewife need have no worry when company appears thirty minutes before meal time, because the canned meat is always ready, and can be prepared in a few minutes.

Methods of Canning.—The old-fashioned method of canning by cooking thoroughly and placing in jars or cans and sealing at once is quite often successful, but not so sure as some other methods. There is too much danger of bacteria getting into the meat while it is being placed into the jars or cans.

The practice of frying down and covering with hot lard is quite successful if the meat is not to be kept too long. The lard, when exposed to heat, light, and air, quite often becomes rancid; and this would, in turn, influence the flavor of the meat.

The cold pack method of canning is becoming more popular every day, for both raw and cooked meats.

Directions for Canning Meats.—

Raw Meat.—Clean the jars thoroughly in hot water. Remove the bones, gristle, and any surplus fat. Cut the meat into pieces small enough to be packed into jars conveniently. Pack the meat closely into the jars up to within one-half inch of the top. For each quart of meat add one teaspoonful of salt. Sprinkle the salt over the top of the meat. Fill the jar with hot water. Adjust the rubber rings and lids. Screw the lids down so that water will not get into the jar, but not tight enough to seal. Place the jars in a hot water bath prepared as follows:

Use a wash boiler or kettle of some kind, place a wire rack on the bottom so that the jars do not touch the bottom. Pack the jars in the warm water so that they

are covered by about one inch of water, and heat gradually to boiling and continue to boil for four hours. Remove the jars and seal at once, cool and store in a dark, dry place.

If you have a pressure cooker, the jars can be partially sealed as before and packed into the cooker instead of the water bath, and the steam pressure raised to 15 pounds and maintained at that pressure for one hour. Cool the cooker down until the steam gauge shows that there is practically no pressure, and then open the steam valve on top. Do not open the steam valve while there is any pressure in the cooker, or the juice in the cans will be in the form of vapor, and most of it will blow off as steam. Remove the jars; seal, cool, and store them in a dry, dark place.

Cooked Meat.—The meat may be partially cooked or completely cooked before canning. Searing the steaks on both sides will tend to hold the juices in the meat and it will give a little different flavor than when canned raw. If the meat is partially cooked, it should be in the hot water bath or pressure cooker the same length of time as the uncooked meat. If thoroughly cooked, it should be sterilized in the boiling hot water bath for three hours, or in the pressure cooker for forty minutes at fifteen pounds pressure, then sealed and stored as before.

Any kind of meat scraps, stew, roasts, steaks, sausage, or soup may be canned, as stated above, and you can always feel certain of a good supply of splendid meat which can be quickly prepared. Usually all that is necessary in the preparation of this meat is to warm it up, or it can be served cold. It makes a splendid dish for hot weather, requiring only a small amount of cooking, and it is always tender.

The pressure cooker is a little more satisfactory than the water bath because the water may not be kept boiling all of the time, and then your meat would not be thoroughly sterilized, or it may boil too fast and crack the jars, or upset them.

CHAPTER XIII

PACKING HOUSE BY-PRODUCTS

Products that were wasted fifty years ago are now utilized to such an extent that the big packing companies can sell the dressed carcasses of cattle and sheep for less than they paid for the live animal. This is not true of hogs, because the hide cannot be taken economically and sold intact. The modern packing plant to-day is operating and making profit on the parts that were formerly wasted. The packers formerly paid somebody to haul this refuse away.

Some of the By-Products, Their Source and Use.—

Blood.—Both edible and inedible products are derived from the blood. The blood to be used for the manufacture of edible products, and for medicinal purposes, is collected under special supervision to insure absolute cleanliness. It is made into blood sausage and blood pudding. Some of the inedible products from blood are: blood flour and blood meal for poultry and stock food. It is also used to make albumen, which is used for the fixing of colors on calico. Another purpose for which blood is used is for the finishing of leather by the tanners. It is also a valuable source of nitrogen in commercial fertilizer.

Hides, Sheep Pelts, and Pig Skins.—The hair from the beef hides is removed and used as a binder in plaster, for making felt and stuffing horse collars. The beef tail switches are curled and used for upholstering furniture,

automobile cushions, and stuffing mattresses. The long fine hair from the inside of the beef ear is used to make camel hair brushes. The hair may be left on the hide and tanned for robes or rugs. The beef hides, after the hair has been removed, are tanned and used for making shoes, belts, machinery belting, furniture, gloves, suit-cases, harness, and saddles, book binding, satchels, and many other articles.

The wool from sheep pelts is pulled if it is three-fourths of an inch long or longer, and used in the manufacture of cloth, felt, rugs, and carpets. The hide is then tanned and used for shoe tops, gloves, suit-cases, cheap saddles, sweat bands for hats, hand bags, and many other articles. If the wool is less than three-quarters of an inch in length, the pelt is tanned with the wool on and used for coat linings, rugs, and other articles. The grease or yolk from the fleece is made into lanolin.

The hair from pigs is used for upholstering. The pig skins, whenever removed from the cuts of pork, are tanned and the leather is made into pocketbooks, hand bags, puttees, and other leather goods.

Hides and skins are also valuable as a source of glue.

Hoofs.—Some of the hoofs are softened with steam, split open, and pressed into flat plates. Various articles, including combs, hair pins, and umbrella handles, are stamped from these plates. Cull hoofs and small hoofs are ground into hoof meal and sold as a fertilizer. After the hoofs have been removed, the feet may be used in the manufacture of neatsfoot oil and glue, and the residue made into steamed bone meal for fertilizer.

Horns and Bones.—After the pith or core has been removed to be used in the making of glue, the horns and bones may be used for making buttons, combs, knife handles, hunting bugles, novelties, pipes, fertilizer, glue

liquor, and some oils. The bones are also used in the case hardening and blueing of steel. Some gelatine is prepared from the connective tissue in skins and bones. This gelatine is used in the manufacture of ice cream and other food dishes.

The glue made from bones, sinews, hide trimmings, horn-piths, skulls, and feet of cattle, sheep, and hogs is used in the glazing of textiles and paper, and in the manufacture of sand paper, furniture, leather belting, shoes, hats, and other articles.

The inedible fats are used for making soap, lubricating oils, candles, and inedible oils for illuminating purposes.

Tallow.—Beef and mutton tallow are the most important elements entering into the composition of soap. The tallow is a compound of fatty acids and glycerin. When it is saponified with caustic alkali, the fatty acids combine with the alkali to form soap and the glycerin is set free.

Glycerin is used in the manufacture of explosives (nitro-glycerin), in photography, and in various industrial arts, for medicinal preparations and for preventing the freezing of water, for instance, in automobile radiators.

The internal fats and other fats which are not sold on the cuts of meat are used for lard, oleomargarine, and edible oils. Oleo stearin, the residue after oleo-oil has been pressed out, is used in the manufacture of candies and chewing gum.

Neatsfoot oil is made from the feet, knuckles, and shinbones of cattle, and is used for dressing soft leathers.

The contents of the digestive tract are pressed and the solid portions used in the boilers for making steam.

The Weasands.—The weasands (swallow or esophagus) are used for casings.

The Stomachs.—The calf stomach is used in the manufacture of rennet for use in cheese making. The calf stomach may also be used for tripe.

The beef stomach is made into tripe. (Pickled stomachs.)

The lining of the pig stomach may be used in the manufacture of pepsin and is used as an aid to digestion or in stomach trouble. The stomach may also be used as a casing for sausage or putty.

The sheep stomach may be used for tripe.

The Small Intestine.—The small intestine of the pig is used for sausage casings.

The small intestine from the beef may be used for sausage casing or in the manufacture of Gold Beater's Skin, which is used as sheets between which gold leaves may be hammered very thin without danger of perforation.

The small intestine of the sheep may be used for sausage casing, music strings, tennis strings, belt lacing, and surgical ligatures (for sewing up wounds).

The Large Intestine.—The large intestine of the pig is used for pork chitterlings.

The large intestine of the beef is used for sausage casing.

The large intestine of the sheep may be used in about the same way as the small intestine.

Bladder.—The bladder may be used for sausage casing, lard, cheese, or putty containers, and covers for glass stoppers.

Scraps.—All scraps of meat unsuitable for edible purposes and bones that are not used for glue are rendered together and made into fertilizer. Meat scraps and blood are also used to make stock food or tankage.

Ox Gall.—The bile of cattle is used in mixing color as

an ingredient in varnish and paints. It is also used in cleaning colored fabrics and for medicinal purposes.

Gall stones are used for ornaments.

Glands.—Pituitary products are manufactured from a very small gland located at the base of the brain. Used for medicinal purposes.

The thyroid glands of sheep are used for making thyroidin. Used to cure abnormal growth in children, such as cretinism.

Suprarenalin is made from the small gland located near the kidney. It is a heart stimulant, and has a powerful astringent effect and is used to stop bleeding. These glands are very small. It requires the glands from 135,000 sheep to make one pound of suprarenalin.

The Pineal gland in cattle is located on the surface of the brain and is very small. It required the glands from 15,000 cattle to make one pound of pineal substance which is used in medical treatment.

The pancreas or belly sweetbread of the hog is used in the manufacture of pancreatin, which is used to peptonize food for infants and invalids.

Thrombo-Plastin is manufactured from the blood.

Other Portions of the Offal.—The various other portions are prepared in very attractive forms. Any of the following list of meats may be found on sale in the up-to-date markets of our larger cities: Brains, Pork Ears, Lamb Fries, Beef Fries (testicles), Calf Feet, Pork Feet, Calf Heads, Lamb Heads, Pork Heads, Hearts, Lungs, Pork Jowls, Beef Kidneys, Pork Kidneys, Pork Lips, Ox Lips, Ox Palates, Livers, Melts (spleen), Pork Snouts, Beef Sweetbreads (Thymus glands), Calf Sweetbreads, Lamb Sweetbreads, Pork Tails, Tripe (stomach), Ox Tail, Oxtail Joints, Pork Knuckles, Beef Hanging Tenders, Tongues, and Beef Suet.

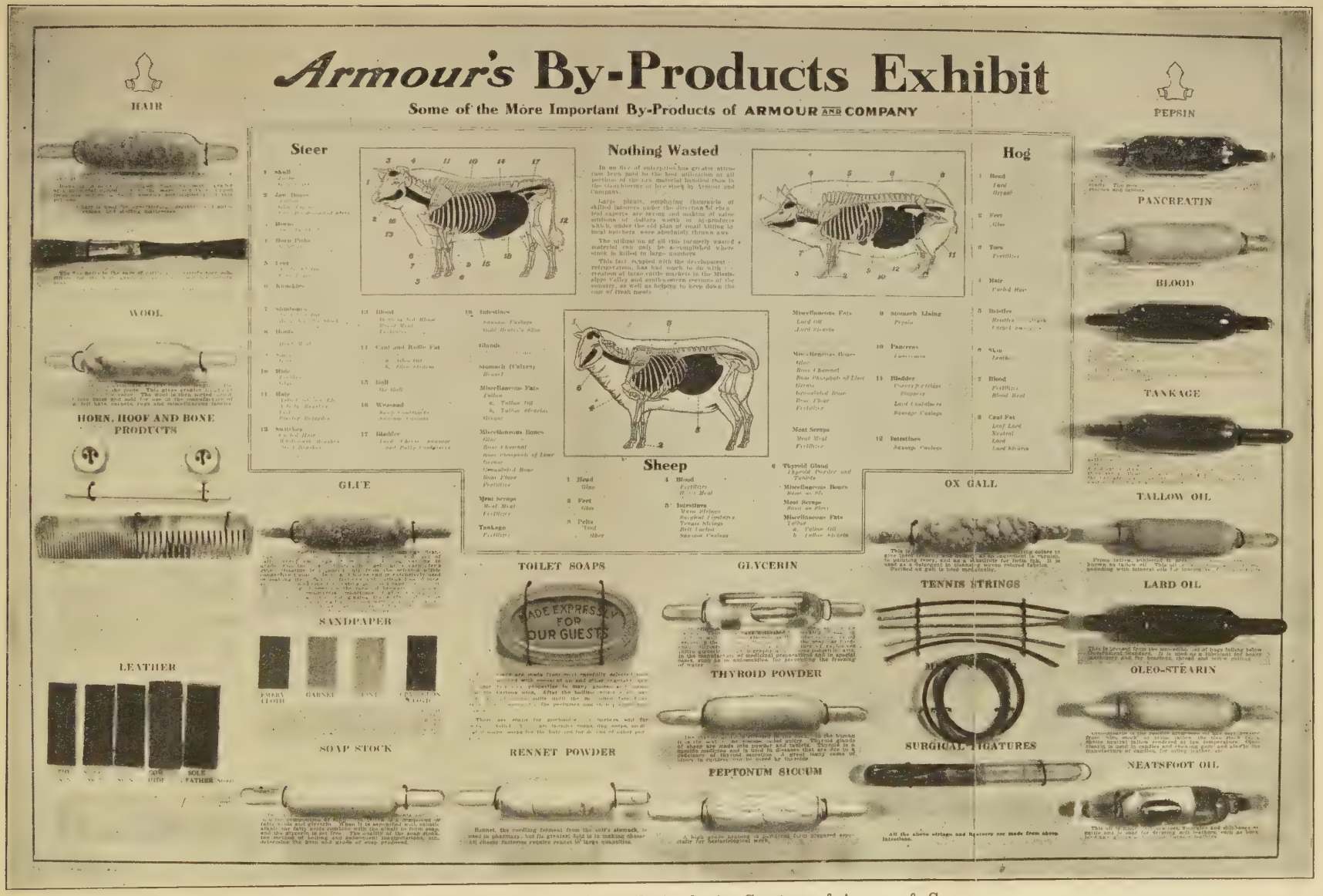


FIG. 107.—Packing house by-products chart. Courtesy of Armour & Co.

Every part of the carcass is made use of. This enables the packers to pay the farmers more for their live stock and sell the carcass for less than they could if this offal were not so economically handled.

TABLE XVIII

THE RELATIVE PROPORTION OF INCOME FROM BY-PRODUCTS

	% from Meat	*% from By-Products other than Hide*	*% from Hide or Pelt*
Hogs	99.6	0.4	Sold with meat
Sheep	69.4	6.1	24.5
Calf	94.6	5.4	Sold with carcass
Cattle	80.5	6.9	12.6

This proportion may vary considerably with the general trend of prices.

The waste waters from the packing plant are evaporated down into a thick, brown, sticky wax, known as "stick" because of its adhesive properties. It is high in nitrogen content and is used in fertilizer.

TABLE XIX

PORK PRODUCTS FROM A 250 POUND HOG
Prices—Pork Cuts—As of May 1st, 1922

	Finished Per cent	*Weights Pounds*	*Wholesale Price Finished Product* *	*Wholesale Price Fresh Meat Basis* †	*Wholesale Value per Head*
Ham, smoked	13.00	32.50	32	27	$8.78
Bellies or Bacon	11.75	29.37	22¼	17	4.99
Loins, fresh	9.50	23.75	23	21½	5.11
Fat Backs, salted	9.50	23.75	8¾	6½	1.54
Lard, rendered	9.00	22.50	10	7	1.57
Picnics, smoked shoulder	5.00	12.50	17	12	1.50
Boston Butts, fresh	4.25	10.63	16	14½	1.54
Clear Plates, salted	2.75	6.87	8¾	6½	.45
Lean Trimmings, sausage	2.25	5.63	9	7½	.42
Jowl Butts, salted	2.25	5.62	7⅞	5	.28
Spare Ribs, fresh	1.25	3.13	11	9½	.30
(1) Misc'l Edible Items	3.00	7.50	5	3⅛	.26
Yield	73.50	183.75			26.74
(2) Edible By-Products	2.25	5.62			.33
(3) Non-Edible By-Products	3.75	9.38			.14
Shrinkage	20.50	51.25			...
Total Live Weight	100.%	250 lbs.			27.21
			Less cost of killing, dressing, chilling, cutting, etc. (approximately)		1.50
					$25.71

(1) Including—Feet, Neck Bones, Tails, Brains, Cheek and Head Meat, Ears, Lips and Snouts.
(2) Including—Plucks, Gullet Meat, Weasand Meat, Giblet Meat, Tongues, Kidneys and Stomach Linings.
(3) Including—Casings, Bungs, Blood, Hair, Grease and Tankage.
NOTE—Although this method of Cutting is typical, proportions vary with changing trade requirements.

* Figures from National Provisioner.
† Expense of curing, smoking, shipping, selling and carrying charges deducted.

TABLE XX

Beef and By-Products from a 1080 Pound Steer

(Finished Weights)

Comparative Values of Beef and Cattle By-Products as of May 1st, 1922

Edible Products	*Pounds*	*Percent*	*Value per Head*	
Beef	586.80	54.4	$64.55	Beef is valued at Chicago Market at the Packing House.
(1) Other Meats	39.17	3.6	2.40	
Oleo oil and Stearine	22.94	2.1	1.46	
Non-Edible Products				By-Product values represent raw net worth on the killing floor before incurring or allowing for any shrinkage or processing expenses.
Hide	63.80	5.9	5.56	
Blood and Tankage	16.46	1.5	.13	
Bones, Horns and Hoofs	14.15	1.3	.....	
Casings	6.40	.6	.59	
Tallow	5.35	.5	.20	
Miscellaneous	5.52	.5	.02	
Shrinkage, Evaporation, etc.	210.51	19.6	....	
Valueless Material	108.90	10.0	.....	
Total Live Weight	1080.00	100.0	$74.91	
Edible Products	648.91	60.1	68.41	
Non-Edible Products	111.68	10.3	6.50	
Shrinkage	319.41	29.6	.....	
Total Live Weight	1080.00	100.0	$74.91	

(1) Including—Tongues, Heart, Liver, Tripe, Head and Cheek Meat, Tail, Brains, Sweet Breads, Lips and Palate.

TABLE XXI

Dressed Lamb and By-Products from a 70 Pound Lamb

(Finished Weights)

Comparative Values of Dressed Lamb and Lamb By-Products, as of May 1st, 1922

Edible Products	*Pounds*	*Percent*	*Net Value (Expenses Out) per Head*
Lamb	35.0	50.0	$9.38
* Other Meats	1.5	2.1	.12
Oleo Oil and Stearine	1.2	1.7	.10
Non-Edible Products			
Pelt	7.2	10.3	2.34
Finished Casings	.4	.6	.10
Rendered Tallow, Oil and Grease	.4	.6	.013
Blood (Dried)	.5	.7	.008
Tankage	1.2	1.7	.006
Trotters	1.0	1.4	No Value
Soft Bones	.4	.6	.007
Valueless Material and Evaporation	21.2	30.3	.....
Total Live Weight	80 lbs.	100%	$12.07
Edible Products	37.7	53.8	9.60
Non-Edible Products	11.1	15.9	2.47
Shrinkage	21.2	30.3	.....
Total Live Weight	70 lbs.	100%	$12.07

* Includes Tongues, Heart, Liver, Sweetbreads and Brains.

CHAPTER XIV

MEAT RINGS

With cattle, sheep, and swine generally present on the farm, the problem of a regular supply of fresh and cured meats for the farmer's table appears, to the casual observer, to be practically solved. But there are many changes which must take place from steer to steak, from live lamb to leg of lamb, and from pig to pork. Our modern system of centralized industry has tended to transfer the killing and curing of meat from the farm to the factory. This has often made it difficult for the producer of the meat, living remote from distributing centers, to get a regular supply of really high-class products, particularly in the hot summer months. Of course, he may corn his own beef and cure his own pork, but curing involves some labor and some danger of loss, shrinkage, and change of flavor. A mixed diet of fresh and cured meats would also be more attractive than a straight diet of cured products. When the weather is cool, it is not so difficult to have a steady supply of fresh meat killed and prepared on the farm. But from May to October the temperature is generally so high that the meat must be cured, canned, or consumed in a short time after the dressing operation is completed. This season must be supplied from cured meats—chiefly pork —some canned pork, beef, or lamb—or from fresh-killed meat, generally beef. During the hot weather and the season of heavy work on the farm, one's taste generally

prefers the leaner and fresh beef rather than so much of the cured, fatter pork.

In order to insure a steady supply of high quality, fresh meat for their tables, farmers, in many communities, have formed themselves into what are commonly termed "Beef Rings," "Meat Rings," or "Beef Clubs." These operate to best advantage in districts where a supply of good fresh beef or lamb is not readily available through butchers, and particularly in those districts where a few good young beef cattle are present on the farms to insure the right class of meat for the "Ring" or "Club."

A great many meat rings are now in operation in rural communities in the United States and Canada.

History of Meat Rings.—It is impossible to obtain accurate data showing the exact time and place at which the first Meat Ring was organized. Page County, Iowa, reports that a club was started there forty-five years ago, and one club in the same county has been running for twenty-seven years without a break. Meat rings have long been successfully operated in Iowa, Missouri, and North Dakota.

In the Province of Ontario, Canada, Beef Rings, as they are called there, are one of the chief sources of the farm meat supply in summer. Many rings have been in existence there for over thirty years.

The Beef Ring or Meat Ring is growing in favor because it supplies better meat at lower cost. Answers to questionnaires returned from sixty-one rings showed prices of meat through the Beef Rings in recent years to be from five to fifteen cents per pound cheaper than from local butcher shops.

How to Organize a Beef Ring.—Before any organization can be a success, it must have a reason for existence.

A Beef Ring is a coöperative concern, and can only succeed when built on mutual understanding and mutual benefit. There must be, in the beginning, a need for such a club. The extent of this need may be best determined by making a canvas and calling a meeting of possible members and discussing all phases of the organization. It should be made clear in the beginning that any who are not in sympathy with coöperation, and who are not willing to exercise a little of the give and take spirit are not wanted in the club, as they will only cause trouble.

Size of the Club.—One of the first considerations is the size of the club. This will vary with the density of population and the needs of the community. Clubs may be composed of from sixteen to forty members. Authorities differ on the optimum number of members for a club. This depends, to a large extent, on the amount of meat desired each time by the members. In Missouri, the sixteen membership ring seems to be quite popular. In North Dakota and Iowa, the twenty-member clubs have the majority. A study of sixty-one rings in Ontario, Canada, made by C. R. Deneau for the Animal Husbandry Department of the Ontario Agricultural College, showed 53 organized on the twenty share plan, running 20 weeks; 6 organized on the sixteen share plan, running sixteen weeks; and two organized on the 24 share plan, running 24 weeks. When everything is considered, the twenty share club seems to be the most satisfactory. If one share furnishes too much beef for any one member, he can get some other member to take a half share. In this way, thirty to forty families may form a twenty share ring. This runs long enough to tide over the period of hottest weather, and it also delivers about the right amount of meat from the handy

size carcass to supply the wants of the average farm family in summer.

Constitution and By-Laws.—A constitution and by-laws should be drawn up and adopted as soon as possible. This may be done at the first meeting, or a committee may be appointed to draft the necessary writings.

The following suggested constitution and by-laws may be helpful.

CONSTITUTION

Article I

This association shall be known as the ———————— Beef Club, and shall consist of 20 members, whose object shall be to furnish each member with his share of fresh beef weekly during the specified season.

Article II

The officers shall consist of a President, Secretary, and Treasurer, whose duties shall be such as usually pertain to such offices; also a managing committee of three members, whose duties shall be to provide a suitable place for slaughtering, and the general oversight of the work of the club. Any vacancy occurring in any office shall be filled by a vote of a majority of members presented at a meeting of the society, as hereinafter provided.

Article III

The suitability of any animal provided for slaughter shall be decided by the managing committee, and their decision shall be final.

Article IV

All officers shall continue in office for the period of one year, unless otherwise determined by a majority of the members.

Article V

The President and Secretary shall be and are hereby empowered to convene all meetings considered necessary by them, and any special meeting at the request of any five members, given in writing.

Article VI

Ten members shall constitute a quorum for the transaction of business.

Article VII

All persons becoming members of this club shall subscribe to the articles of this constitution, and will be governed thereby.

Article VIII

The annual meeting shall be held at a place and on a day agreed upon, for the purpose of closing up the business for the current year, enrollment of members, election of officers, and for the transaction of all business which may be brought before the meeting.

BY-LAWS

Section 1

The Club shall elect someone to the position of butcher, or shall empower the managing committee to engage a butcher whose duties are hereinafter defined.

Section 2

Each member shall furnish one steer or open heifer, the age of which shall not exceed two years, and of a weight to furnish a carcass of about 400 pounds, suitable for the purpose of the club during the season, in his allotted turn, said season to consist of twenty weeks, commencing and ending at such times as may be determined at any regular meeting.

Section 3

The order in which each member shall furnish his animal shall be decided by lot at the annual meeting. After this meeting, at the annual meeting each year, the order shall be arranged by having the last five members take the first five places, the remaining members moving down correspondingly.

Section 4

Each member shall deliver his animal to the place of slaughter during the day previous to the day appointed by the club for the slaughtering of each animal, and such delivery shall be made before 6 p. m.

Section 5

After the animal has been killed, it shall be the property of the club. Should it be condemned as unfit for food, or should it happen with an accident which would render it unsuitable, the club shall decide who shall bear the loss.

Section 6

Each member furnishing an animal shall be entitled to and receive its rough tallow, head, heart, and liver.

Section 7

The butcher shall weigh each carcass when dressed, and keep an account of the weight, giving due credit to the member furnishing the carcass. He shall cut and distribute weekly, to each member of the club, an equal portion of the carcass, as near as he can judge in the division, and keep strict account of the amount furnished each member per week, and at the end of each season settlements shall be made in accordance with the accounts kept by the butcher, and the price per pound agreed upon by the club at a regular or special meeting.

Section 8

The butcher shall be the judge of the suitableness of all carcasses furnished, and may reject any, subject to an appeal to the Managing Committee.

Section 9

The butcher shall, in accordance with the foregoing rules, distribute the carcass by placing each member's portion on a hook bearing the name of that member. These hooks are generally arranged at the place of slaughter.

Section 10

The butcher shall market all hides and pay over to the Treasurer the money for same, and shall receive for his services the sum of ———— dollars per head for all animals slaughtered and cut up by him, said sum to be paid each week by the share furnishing the beef.

Section 11

No member shall have the privilege of withdrawing from the club without the consent of the majority of the members, and in

no case shall a member be allowed to withdraw until his accounts with the club are all settled.

Section 12

The foregoing articles and regulations governing this club shall remain in full force and virtue unless amended by a two-thirds vote after a notice of such amendment has been regularly given in writing.

A copy of the above regulations should be signed by every member of the club, said copy to be filed with the records of the Secretary. It would be well if each member of the club could have a copy of the above regulations.

Place and Frequency of Killing.—Agreement as to frequency of killing is made at the organization or annual meeting. The majority of clubs kill once a week, only a few killing once a fortnight. The date should be set then when each member shall deliver his beef and it is well to have a distinct understanding regarding the time of delivery of both animals and shares. A beef should have twenty-four hours without feed before being slaughtered and should be delivered to place of slaughter by 6 P.M. the day before. Early delivery avoids undue heating of the animal and insures that it is cooled down to normal before being killed. Butchers usually kill some time after four o'clock in the afternoon, preferring the cool of the evening to do the work. The carcass is then allowed to cool over night and is ready to cut early the next morning. Most rings or clubs make it a rule to have the shares cut and on the hooks by 6 or 6.30 A.M. so that the meat may be taken home in the cool of the early morning, and also so as not to interfere with the day's work on the farm.

Killing is generally done in an improvised slaughter house. It is not necessary to go to any great expense in providing this temporary killing place. Usually a small

barn is selected in a central location for the club members and is fitted with a windlass, cutting block, and beef hooks. Usually each member furnishes his own hook. If such an unused barn is not available, a small slaughter house of a permanent character may be erected. A killing space of 10 feet by 16 feet, with a concrete floor, is sufficient for the purpose. Care should be taken to select a central location for this structure. The cen-

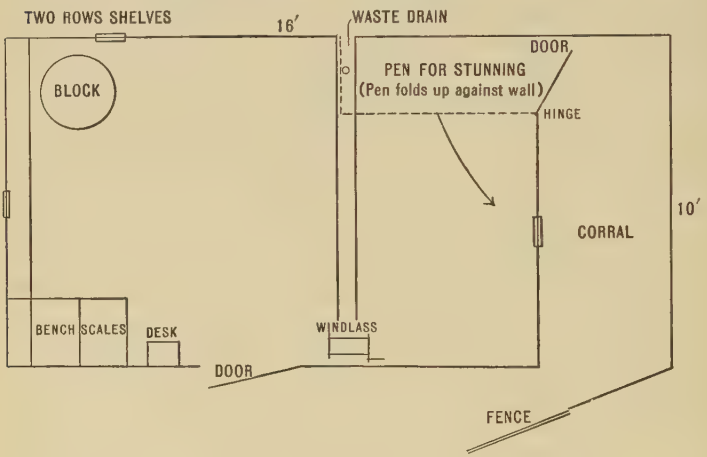


Fig. 108.—Interior of small slaughter-house.

tral slaughter house has many advantages, although some clubs, with members widely scattered, prefer to transfer the killing from farm to farm as the member's turn to supply the meat arrives. The central killing place is handier and more sanitary.

Some clubs, who own a central slaughter house, also provide a small ice house 16 feet by 18 feet in which to store ice for cooling. This is generally filled by having the members themselves coöperate to do the work. It is a good investment, but is not considered absolutely

necessary. However, a carcass thoroughly and quickly cooled cuts better and keeps more satisfactorily than one not so cooled. The cooling room in the ice house, which should adjoin the slaughter room, may be 8 feet by 10 feet by 8 feet high. Ice is packed around it 6 feet wide on three sides and 3 feet deep on top. The ice is preserved by packing sawdust one foot thick between the walls and the ice and 18 inches deep on top of the ice. The killing place should be central, clean, cool, and sanitary. (*See* Fig. 108.)

Systems of Contributing Animals.—While a system of contributing animals is given, in the proposed by-laws outlined above, some clubs may desire to adopt a different method of determining the time at which each member shall deliver his beef. The three following methods are all in general use:

1. All shareholders draw lots at the annual meeting for dates of contributing animals the next season. Exchange of lot tickets, after drawing, may be arranged between members with the approval of the managing committee.

2. The shareholders may be divided into two equal groups. One group contributes all the animals for the first half of the season of one year and for the second half of the seasons of the following year. The shareholders of each group draw lots for dates of contribution.

3. The shareholders may be divided into four groups of an equal number. One group contributes all the animals for the first quarter of the season of one year, for the second quarter of the season of the second year, and so on in rotation. The shareholders draw lots in each group for actual date of delivery.

The last named system is in most favor, for, over a period of years, it equalizes delivery and gives each

member a fair chance. It would not be fair to allow one member to go first or last every year, for there is a difference in the cost of finishing on the grass and in the stable.

The Beef Supplied.—Older animals than the two-year-old form should not be passed by the inspectors or managing committee. The success of the club depends primarily on the even high quality of the beef supplied. The quality of the beef obtained through a beef club is, and should be, superior to the quality of beef secured in the average retail butcher shop where the country butcher has to depend upon a low grade of dressed beef shipped in or upon the culls of the herd if he does his own slaughtering. Not much of the real good beef shipped to central killing places for slaughter ever finds its way back to the farmer's table, and generally the best of the beef carcasses are shipped out in loads and not sold to the local butcher. Regardless of the quality of butcher's beef, the beef club beef must be better. Success depends upon quality. To keep up this quality, none other than animals of recognized beef type should be used for the beef club. Cattle with a preponderance of dairy blood should not be passed by the committee in charge. It is safer to use only cattle of good breeding—generally high grades of one of the recognized leading beef breeds. The good beef club animal should be low-set, deep, thick, blocky, and well and evenly covered, with a considerable depth of natural fleshing. It must carry sufficient finish to insure tenderness, juiciness, and quality in the beef. Long-legged, slab-sided, narrow-chested, cat-hammed cattle will put an end to a beef club if allowed to pass. It is better to offend one member by rejecting a cull than to offend nineteen others by passing it. Usually, however, members of

a club take pride in furnishing a high-class animal for the beef club, and local competition in this helps to insure the very best beef.

A heifer is just as suitable as a steer, provided she carries the desired smoothness and finish. Inspectors should insist on the stuff being open, however. Bred heifers and young cows are dangerous to the success of the ring. Animals dressing very much under 400 pounds and over 500 pounds are not best suited to beef club purposes. Carcasses of about four hundred pounds are most desirable.

Cost of Slaughtering.—The cost of slaughtering varies in different localities. In Ontario, fifty-two clubs report the following prices as paid to butchers for each animal killed and distributed:

1	club	at $6.00
12	clubs	at $5.00
18	clubs	at $4.50
14	clubs	at $4.00
4	clubs	at $3.50
3	clubs	at $3.00

In some cases the butcher had to salt the hide, ship it, and return the proceeds of the same to the contributor.

The disposal of the offal is generally the duty of the contributor.

Delivery of the Meat.—Two or three systems of meat delivery are in vogue in beef clubs. Many clubs leave it to each member to go and get his own meat each week, requiring each to have a suitable sack on his hook for the butcher's convenience each cutting day. In other clubs, members from one neighborhood take turns in bringing home the beef for all. Five or six often band together thus for mutual benefit. In other clubs, the man who furnishes the beef is required to deliver each lot to its rightful owner. This latter system has the

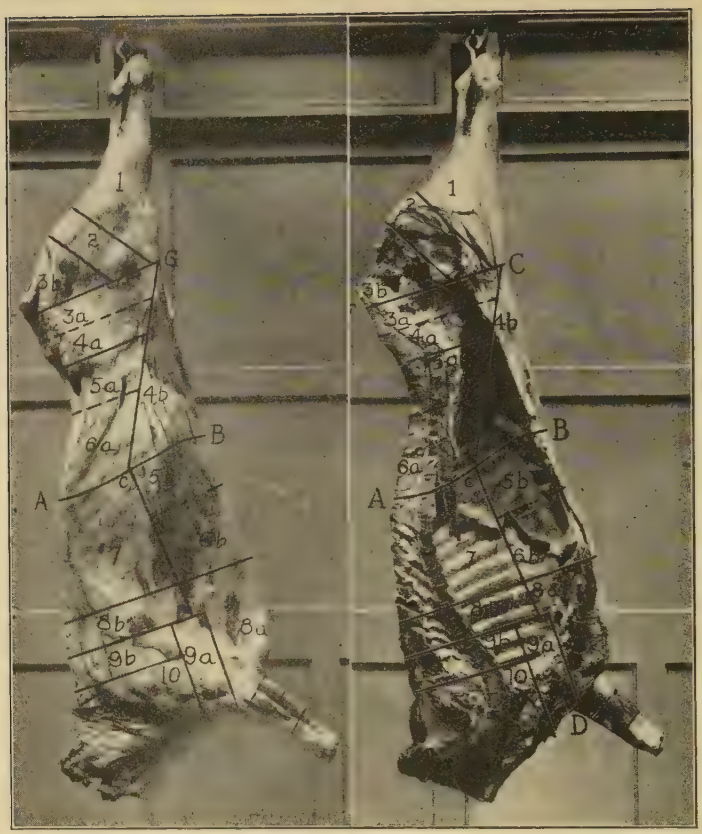


FIG. 109.—A carcass of beef from an 800-pound heifer, showing how to make cuts for 20-share beef ring and approximate weights of each. Shares divided so that two families may divide one share:

(1) Round, shank on; 20 lbs. This share receives hide, rough tallow, liver.
(2) Round roast; 20 lbs. This share to receive heart and tongue.
(3) 19 lbs.: a. Half of sirloin, 10 lbs.; b. rump, 9 lbs.
(4) 21 lbs.: a. Half of sirloin, 10 lbs.; b. flank, 8½ lbs.; boiling piece from fore shank, 2½ lbs.
(5) 21 lbs.: a. Half of porterhouse, 10 lbs.; b. half of navel, 8½ lbs.; boiling piece from fore shank, 2½ lbs.
(6) 21 lbs.: a. Half of porterhouse, 10 lbs.; b. half of navel, 8½ lbs.; boiling piece from fore shank, 2½ lbs.
(7) Prime ribs, 20 lbs.
(8) 23 lbs.: a. Brisket, 13 lbs.; b. first chuck roast, 10 lbs.
(9) 22 lbs.: a. Round bone pot roast, 12 lbs.; b. second cut chuck, 10 lbs.
(10) Shoulder and neck, 21 lbs.

advantage of getting all delivery work over at once for each member, but it often necessitated late delivery for those at the far end of the delivery area.

Cutting the Carcass.—Various methods of cutting the carcass are followed. In some twenty-share clubs, exactly twenty pounds of meat are weighed out to each member each week, if the carcass will cut 400 pounds or over, any overplus goes to the member supplying the beef. This leaves less adjusting at the end of the season.

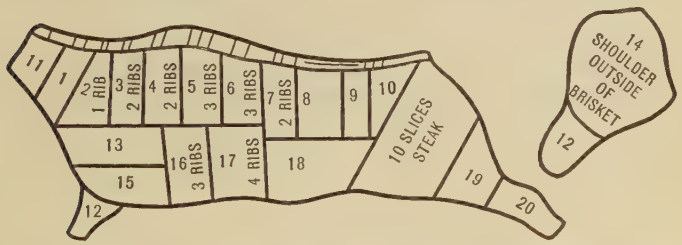


FIG. 110.—Chart for twenty-share Beef Club. (From Circular No. 39, Ontario Department of Agriculture.)

Beeves under weight are divided equally and the owner required to pay for the shortage. Most clubs, however, follow the system of dividing each week's carcass equally among all the members and have all adjustments made at the end of the year at a set price for the beef. This is the better system if the carcass weights run close to the 400 pounds required.

In some clubs the method followed is to give each member all of one class of meat in a week. That is, he would get all steak one week and all roast one week and all boil one week. This system is not so well liked as that which supplies one-third of the meat in roasts, one-third in steaks, and one-third in boiling meat each week. In this latter system, the two sides are cut alike, each

member receiving a roast, boiling piece, and share of steak according to chart 109; that is, the first and eleventh members on the list received the roast marked 1 and the boil marked 14, with one slice of steak; the next week these two members receive the roast marked

FIG. 111.—Chart for sixteen-share Beef Club. (From Circular No. 39, Ontario Department of Agriculture.)

2 and the boil marked 13 with slice of steak, the tenth and twentieth members taking their turn with roast 1 and boil 14. (*See* Fig. 110.)

Members	*Roast*	*Boil*	*Steak*
Nos. 1 and 11	1	14	1
Nos. 2 and 12	2	13	2
Nos. 3 and 13	3	19	3
Nos. 4 and 14	4	16	4
Nos. 5 and 15	5	17	5
Nos. 6 and 16	6	18	6
Nos. 7 and 17	7	15	7
Nos. 8 and 18	8	12	8
Nos. 9 and 19	9	20	9
Nos. 10 and 20	10	11	10
No. 21	Head and Heart, etc.		

In a sixteen-share club each half is divided among the first eight persons, giving each a roast, a boil, and a slice

of steak, as indicated for the twenty-share ring. (*See* Fig. 111.)

In cutting the carcass for a twenty-four-share club, the round is used for two roasting pieces instead of being cut

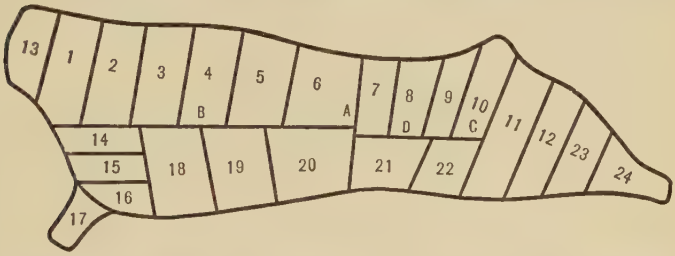


Fig. 112.—Method of cutting for a twenty-four share Beef Club. (From Agricultural Extension Bulletin No. 5. North Dakota Agricultural College.)

into steak, as for the sixteen- and twenty-share clubs or rings. (*See* Fig. 112.)

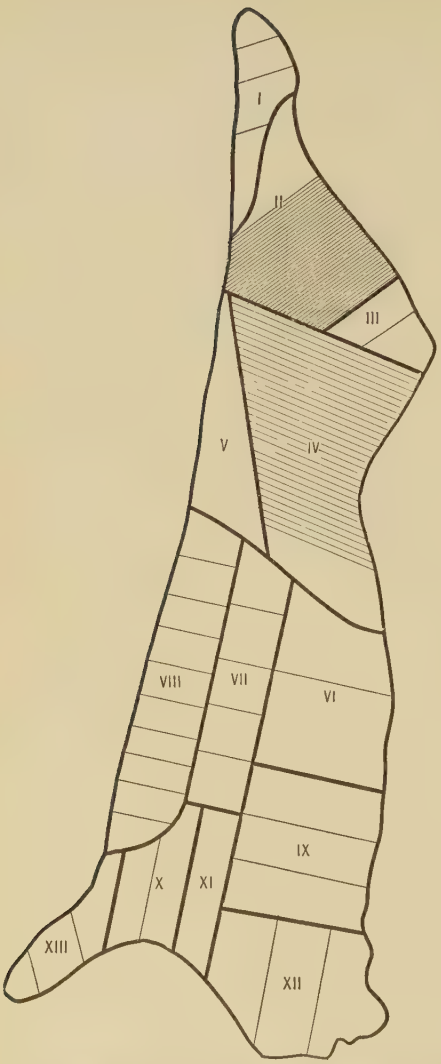
For a 24-Share Club

Members	*Roast*	*Boil*
Nos. 1 and 13	1	14
Nos. 2 and 14	2	15
Nos. 3 and 15	3	13
Nos. 4 and 16	4	16
Nos. 5 and 17	5	17
Nos. 6 and 18	6	18
Nos. 7 and 19	7	19
Nos. 8 and 20	8	23
Nos. 9 and 21	9	24
Nos. 10 and 22	10	20
Nos. 11 and 23	11	21
Nos. 12 and 24	12	22

Suggestions Offered by Club Secretaries.—

From an investigation of sixty-one clubs in Ontario, the following suggestions were made by secretaries:

1. Avoid late delivery of animals to the slaughter house.



I. Hind shank — 3 soup bones.

II. Round — 1 pot roast, 12 to 15 steaks.

III. Rump — 2 roasts, 3 soup bones.

IV. Loin — 20 to 25 steaks, 1 two-rib roast.

V. Flank — 7 pieces boiling meat.

VI. Prime ribs — 2 three-rib roasts.

VII. Short ribs — 5 squares boiling meat.

VIII. Navel and brisket — 10 squares boiling meat.

IX. Chuck — 3 roasts.

X. Round bone pot roasts — 2 roasts.

XI. Shoulder — 1 roast, 1 soup bone.

XII. Neck — 3 pieces boiling meat.

XIII. Shank — 2 soup bones.

FIG. 113.—A method of cutting which provides one-third of meat in roasts, one-third in steaks, and one-third in boiling meat.

2. Any shareholder who contributes inferior or poorly finished beef should be bought out.

3. Have all animals carefully inspected.

4. Make all settlements and adjustments promptly at the close of the season.

5. Encourage coöperation in the delivery of meat.

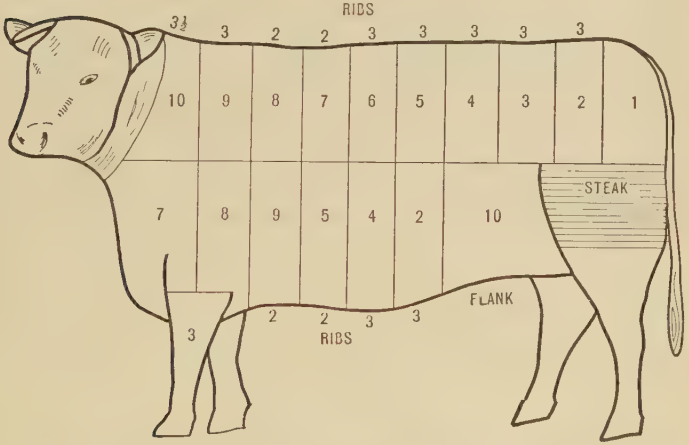


FIG. 114.—A chart used by a local butcher for a club in Simcoe County, Ontario, 25 years ago. (From the *Farmer's Advocate*, 1904.)

6. Do not allow the butcher to disregard the system outlined in his cutting charts.

7. Where half shares are sold, the club should let the two members concerned settle all matters of contributing the animal between themselves.

8. It always pays to adhere closely to all rules laid down in the constitution and by-laws, and to allow no quibbling.

The Annual Meeting.—The annual meeting of the beef club may be made a social as well as business affair.

Rural districts are none too well blessed with facilities for social intercourse, and many clubs which have been in successful operation for several years hold an oyster or fowl supper at the close of the season, and make the annual meeting an eagerly anticipated event. This is

	A. SMITH	J. JONES									TOTAL POUNDS	TOTAL DOLLARS
A. SMITH												
J. JONES												
TOTAL POUNDS												
TOTAL DOLLARS												

FIG. 115.—Chart for 10 members. A similar chart is made for the other 10. For 21 members add an extra line for the odd member. (From Circular 39, Ontario Department of Agriculture.)

good business and serves to foster the coöperative idea of each for all and all for each. It also serves to cement friendships more closely and works out to the mutual benefit of all concerned. It helps to get the whole family interested in the affairs of the club, and aids in smoothing over difficulties which may arise over little inequali-

ties which are sure to occur but which are evened up over a period of years. Every beef club member should plan to continue his membership year after year. The in-and-outer is no strength to any club.

Beef Clubs and Success.—From a careful study of the outline here given and based on the work of clubs in various sections of the United States and Canada, the following observations are made:

1. Beef Clubs are, in many sections, the best source of summer meat for the farm.

2. Where a competent butcher may be had at a fair wage there should be no cause for failure, provided members exercise the true spirit of coöperation.

3. A club of twenty members or twenty shares with a twenty-week killing season suits most conditions. However, a sixteen-share or twenty-four-share club is satisfactory in some districts.

4. Beef Clubs furnish higher quality and more nutritious meat for summer than can be obtained by curing pork alone, and generally make available a better quality of beef at smaller cost than where the country butcher is depended upon for the supply.

CHAPTER XV

COUNTRY HIDES AND SKINS

A great many country hides and skins are damaged and lost each year, simply because the farmer, ranchman, and country butchers do not know how to handle their hides properly. There is no uniformity in the way the hides are removed and cured before being sold. The farmer is the greatest producer of hides. He markets them either on the live animal or directly to the hide buyers. Buyers have learned to discriminate between hides. They are classified first according to their source, *viz.*: packer hides and skins and country hides and skins. The packer hides and skins are more valuable than the country hides because they are taken off uniformly and carefully by experts employed especially for that purpose. Very few cuts or scores are made and very little meat is left on the hide. The packers remove the hides in large numbers. The hides are classified and uniformly cured before being sold. They may be purchased in large quantities of the same grade. On the other hand, each farmer removes the hide according to his own ideas.

Handling Country Hides and Skins.—Animals should be handled very carefully before killing. Many hides are badly damaged before the animal is killed. Holes may be punched in the hide, or it may be bruised. In the case of sheep, the animal should never be held by the wool, as this will cause a bruised spot or small clots

of blood in the hide, and it will not cure evenly. A clean place should be used for the killing and skinning operations. Never drag the carcass to another place before skinning, because this will rub the hair off and burn or destroy the grain of the hide. The hide can be removed more easily before the carcass cools out. Carcasses should never be allowed to lie a day or so before skinning, because putrefaction begins almost at once, especially if the weather is a little warm. Sticking should always be done by cutting lengthwise along the lower side of the neck. If cut across the neck the hides are known as "cut throats" and are lower in value than when properly stuck.

Care should be taken not to use sharp prods, polls, or pritches to hold the animal on its back while skinning. The sharp point will damage the hide. It would be much better to get a large rock or chunk of some kind to lay on each side of the animal.

The details of the skinning operation are presented elsewhere in this text. In skinning, hold the knife almost flat, with the back edge near the hide. Great care should be taken to prevent cutting or scoring the hide.

In removing the sheep pelt, the knife should not be used any more than is absolutely necessary.

Some Common Faults of the Country Hides:—

Poor pattern, legs irregular in shape, heads hanging by string necks.

Dew claws left on, and tail bone not removed.

Too much meat on the cheeks and sides.

Bad cuts and scores.

Neck cut crosswise instead of lengthwise when the animal was bled.

Hide rubbed until grain is gone by dragging or otherwise.

Grain slips, where the hide has not been thoroughly cured and the hair is slipping off.

The next important operation is to cure the hide properly, or at least to take care of it until it is sold to some one who will cure it properly. In cool weather, hides may be kept for several days without salting. They should not be allowed to freeze. In warm weather, they should be salted as soon as the butchering is done and the animal heat is all out of the hide. Sometimes this takes several hours. If the hide is salted before the animal heat is removed, the hair sometimes slips and the hide is graded as a No. 2. If you expect to hold the hide any length of time, it should be spread out flat, the ears should be split, and the flesh side covered with about thirty pounds of fine rock salt, or common barrel salt will do. Be careful that the hide and salt are both clean or the hide will be discolored. The hide can then either be allowed to lay flat or have the sides thrown in until the hide is about two feet in width. Begin rolling at the head end. Tie the bundle with a strong cord, never use wire; and store in a cool place where there is not too much circulation of air. Horse hides are salted in exactly the same way. Hides will cure in good shape, in four or five weeks. Sheep pelts should be covered with fine salt and allowed to lay flat for four or five days and then hung up to drain. Sheep pelts may be kept in this way for several months.

If you are near enough to a hide dealer so that the hide could be sold the day after skinning, it would be advisable to sell the hide green and let the dealer salt it. Never try to ship green hides in warm weather; always salt them first.

Market Classification of Hides.—The market classification of hides is somewhat indefinite. Different classes

are given in the different publications which give quotations on hides.

Factors to be considered in classifying hides:

1. *Sex.* There are many sex differences. Bull hides are thicker over the shoulder and lighter over the hind quarters. Cow hides are thicker over the hind quarters than over the shoulder. Steer hides are more uniform in their thickness.

2. *Weight.* Heavy and light hides are tanned and used for different purposes. The light hides are usually sold for about one cent less per pound. Light hides are under sixty pounds and heavy hides are sixty pounds and over. Buffs (steers), forty-five to fifty pounds. Buffs (cows), forty-five to sixty pounds.

3. *Size.* Hides are measured from brisket to brisket. Spready hides must measure six feet and six inches.

4. *Brand.* Branded hides usually sell for about 10 per cent less than unbranded. The hides may be either butt branded or side branded. Texas cattle are usually branded on the rump, while Colorado cattle are usually branded on the side, and are known as "Colorados," regardless of place of origin. Unbranded hides are spoken of as natives. About 50 per cent of the hides on the market are branded. The leather from the branded part of the hide wears out very quickly. Branded leather seems to be lifeless.

5. *Time of year for removal.* Hides are considered thicker in winter than in summer.

6. *Grubby hides.* Hides with five or more grub holes are classed as grubby and sell for about one cent per pound less than No. 1 hides. Texas cattle are apt to have grubby hides between November 1st and June 1st; Colorados between December 1st and June 1st, and natives January 1st to June 1st. These are known as the

grubbing seasons. A great many hides are damaged each year by grub holes.

7. *Age.* Calf hides are graded different from the cattle hides, and are sometimes sold by the piece. Slunk skins are from either unborn or stillborn calves. Deacon skins are from new-born calves.

8. *Condition of hide.* All badly tainted, scarred, cut, scored, and murrian* or fallen hides shall be classed as damaged, unless they are very badly damaged, when they are classed as glue stock.

9. *Cured or partially cured.* Green hides are just as they come from the animal, never having been salted.

Green salted hides are those which have not been salted long enough to be thoroughly cured.

Dry flint are thoroughly dry hides that have not been salted.

Dry salted hides are thoroughly dry hides, having been salted while green.

All dry hides twenty-five pounds and over shall be called heavy, and all dry hides under twenty-five pounds shall be called light.

10. *Kosher killed cattle.* The hides from Kosher cattle are known as "cut throats" and usually sell for about one-half cent per pound less, because the hide has been cut across the neck instead of lengthwise.

All hides shall be free from salt, dung, dirt, meat, horns, tails, bones, or sinews before being weighed or a proper reduction made from the weight. Tare for salt shall be arrived at in all cases by tanneries by shaking the hides five times on each side.

* Murrian or fallen hides are those from animals dying from disease or accident and the hide is not removed at once.

TABLE XXII

THE MARKET CLASSIFICATION OF HIDES AS PUBLISHED BY ARMOUR AND COMPANY. PROGRESSIVE BEEF CATTLE RAISING

PACKER HIDES

	Specifications	*Average Weight*
STEERS:		
Natives.		
Spready	Minimum width 6′ 6″	
Heavy	Cured weight 60 lbs. up	62-65 lbs.
Light	" " 50-60 lbs.	54-55 lbs.
Extreme Light	" " 25-50 lbs.	40-45 lbs.
Branded.		
Butt Branded	" " 50 lbs. up	60-65 lbs.
Colorados (side branded)	" " 50 lbs. up	60-65 lbs.
Heavy Texas	" " 60 lbs. up	63-65 lbs.
Light Texas	" " 50-60 lbs.	55-56 lbs.
Extreme Light Texas	" " 25-50 lbs.	40-45 lbs.
COWS:		
Natives.		
Heavy	" " 55 lbs. up	60 lbs.
Light	" " 25-55 lbs.	42-48 lbs.
Branded	" " 25 lbs. up	43-55 lbs.
BULLS:		
Natives	" " 25 lbs. up	70-85 lbs.
Branded	" " 25 lbs. up	70-85 lbs.
CALVES:		
Kips	" " 15-25 lbs.	
Packer Calves	" " Under 15 lbs.	
Slunks	Sold by the piece	

COUNTRY HIDES

HEAVY:	
Steers	60 lbs. up
Cows	60 lbs. up
BUFFS	45-60 lbs.
EXTREMES	25-45 lbs.
BULLS:	
Branded.	
Side branded country packer	25 lbs. up
Side branded country	25 lbs. up

CALFSKINS:	
Kips	15-25 lbs.
Calf	8-15 lbs.
Light calf	Under 8 lbs.
Deacons	Under 7 lbs.
Slunks	Sold by the piece
HORSE HIDES	Sold by the piece
HOGSKINS	Sold by the lb.

"Dry hides are not normally an important factor in the American hide market. South American hides are marketed dry in relatively large numbers, due to the relative permanence of the hide in that form, but the cost of gathering for market in the United States is such that producers today get practically nothing for their dry hides. Fallen hides are those removed from dead animals, while glue hides are those unfit for tanning."

Dry Hides
- Heavy westerns
- Light westerns
- Kips
- Calfs
- Fallen
- Glue Hides
- Dry salt hides

TABLE XXIII

THE CLASSES AND GRADES OF PACKER HIDES AND SKINS AS PUBLISHED IN FARMERS' BULLETIN 1055, U. S. DEPARTMENT OF AGRICULTURE

CLASSES AND GRADES OF PACKER HIDES AND SKINS

Class	*Weight selections*	*Grade*
NATIVE STEERS:		
Spready native steers	60 lbs. and up	No. 1 and No. 2
Heavy native steers	" " " "	" " "
Light native steers	50 to 60 lbs.	" " "
Extreme light native steers	25 to 50 lbs.	" " "
TEXAS STEERS:		
Heavy Texas steers	60 lbs. and up	" " "
Light Texas steers	50 to 60 lbs.	" " "
Extreme light Texas steers	25 to 50 lbs.	" " "
BUTT BRANDED STEERS:		
Heavy B. B. steers	60 lbs. and up	" " "
Light B. B. steers	50 to 60 lbs.	" " "
Extreme light B. B. steers	25 to 50 lbs.	" " "

Class	*Weight selections*	*Grade*
COLORADO STEERS:		
Heavy Colorado steers	60 lbs. and up	No. 1 and No. 2
Light Colorado steers	50 to 60 lbs.	" " "
Extreme light Colorado steers	25 to 50 lbs.*	" " "
NATIVE COWS:		
Heavy native cows	55 lbs. and up	" " "
Light native cows	25 to 50 lbs.	" " "
Branded cows	All weights from 25 lbs. up	" " "
Native bulls	" " " " " " "	" " "
Branded bulls	" " " " " " "	" " "
CALVES:		
Kipskins	15 to 25 lbs.	" " "
Branded kip	" " "	" " "
Heavy calf	8 to 15 lbs.	" " "
Light calf	7 to 8 lbs.	" " "
Deacon skins	Up to 7 lbs.	
Slunk skins		

THE CLASSES AND GRADES OF COUNTRY HIDES AND SKINS COMMONLY USED IN THE CHICAGO MARKET AS PUBLISHED IN FARMERS' BULLETIN 1055, U. S. DEPARTMENT OF AGRICULTURE

CLASSES AND GRADES OF COUNTRY HIDES AND SKINS

Classes	*Weight*	*Grades*
Heavy native steers	60 lbs. and up	No. 1 and No. 2
Light native steers	50 to 60 lbs.	" " "
Heavy native cows	60 lbs. and up	" " "
Buffs (steers, cows, bulls) †	45 to 60 lbs.	" " "
Extremes (steers, cows, bulls)	25 to 45 lbs.	" " "
Bulls (heavy native)	60 lbs. and up	" " "
Branded bulls (heavy)	" " " "	" " "
Branded hides (steers, cows, bulls)	25 lbs and up	" " "
Kipskins	15 to 25 lbs. ‡	" " "
	15 to 30 lbs.	" " "
Heavy calfskins	8 to 15 lbs.	" " "
Light calfskins	7 to 8 lbs.	" " "
Deacon skins	Up to 7 lbs.	
Slunk skins		

* Same as branded cows or extreme light Texas steers.

† Unbranded.

‡ Southeastern and Western Coast Sections 15 to 30 lbs., all others 15 to 25 lbs.

Tanning Hides on the Farm.—A great many methods of home tanning of hides have been published, but few have been successful on the farm. The process of tanning is an interesting one, but it is somewhat difficult to carry on under farm conditions. It requires considerable time to tan a hide properly.

The following methods of tanning have given splendid results in the class work at Iowa State College.

Tanning Beef Hide with the Hair On.—If the hide has been salted or partially cured it should be soaked in cold water until it is soft and free from blood. Trim off all of the ragged ends including the legs, tail, and head. Remove all surplus flesh and fat by scraping or shaving with a dull knife, drawing knife, corn knife, old skate, or a hoe. This can be done by laying the hide on a smooth surface, as shown in Fig. 116. Be careful not to injure the dermis or true skin. Wash and clean the hide thoroughly with soap and soft water. After carefully rinsing the hide it is ready for the tanning liquor, which may be made up as follows:

One gallon of sour buttermilk
One gallon of soft water
Eight ounces of commercial sulphuric acid
Two ounces of saltpeter
One ounce of borax
Thirty-two ounces of salt

Dissolve salt, saltpeter, and borax in water; add buttermilk, and lastly the acid; add slowly and stir constantly. Place the hide in a clean barrel or a twenty-gallon jar and cover with the above solution. The above will be sufficient for a small calf skin. About ten gallons of the above mixture will be required for the ordinary fifty-pound beef hide. This can be increased in proportion to the weight of the hide. This tanning liquor may

be kept for two to three months, and may be used for several hides.

Stir every hour for about eight to ten hours and then

FIG. 116.—Fleshing a hide. Showing home-made rack for fleshing, cleaning, and working hides.

allow the hide to remain in the solution about forty-eight hours.

Remove the hide and wash thoroughly, and hang up to

dry. Work and stretch the hide while drying. This is very important. The more the hide is worked and

FIG. 117.—Showing rack for stretching small skins and pelts or for one beef hide.

stretched the better. If not sufficiently worked the hide will become harsh and hard. The working may be accomplished by drawing the hide back and forth across

a post or beam until dry and flexible. If a smooth surface is desired the flesh side may be worked down with sandpaper and pumice stone.

The above formula on May 1, 1922, cost approximately two dollars for tanning a fifty-pound hide.

The above is a modification of a formula published by the *Canadian Countryman*, December 12, 1921.

FIG. 118.—One method of working and stretching a tanned hide.

Tanning Beef Hides for Leather.—The hide must be soft, preferably fresh. If not fresh it should be soaked in soft water until it becomes soft. Soak the hide in the following solution:

5 gallons of soft water and four quarts of unslaked lime.

Allow the hide to remain in this solution until the hair slips. This usually requires three to four days. Scrape off the hair with a dull instrument, being careful not to injure the skin. Wash the hide thoroughly and soak in pure soft water about six hours in order to remove

all lime. After the hide is clean it is ready to tan. Use the same tanning formula as in tanning beef hide with the hair on. This will produce a very tough dry leather. (*See* Fig. 120.)

Tanning a Sheep Pelt.—The following formula may be used for ordinary sheep pelts. It is not advisable to try to tan a pelt with a fleece more than two inches long.

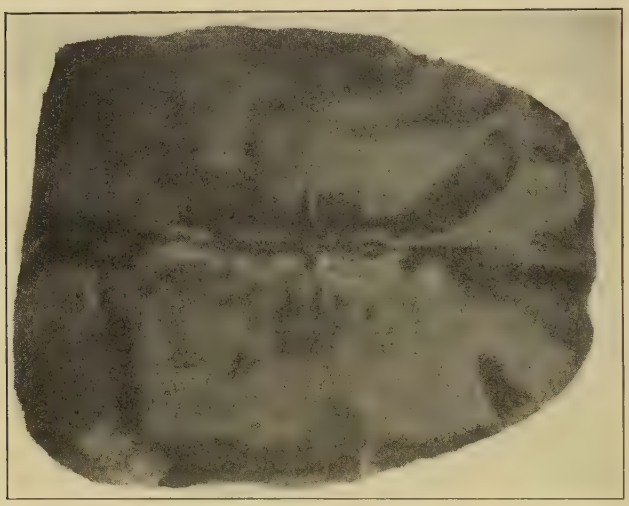


FIG. 119.—Showing beef hide tanned with the hair on.

Trim off head and other worthless parts; then scrape the flesh side with a dull knife to remove any fat or flesh. Great care must be taken not to injure the skin. Sheep pelts are very thin and may be cut or torn quite easily. The inner layer which forms the soft leather may be rubbed off quite easily. Wash out all blood and foreign material with cold soft water. Warm water will injure the hide and cause the wool to slip.

Lay the pelt on a flat dry surface with the flesh side up and apply the following mixture:

5 pounds of fine salt mixed with 1 pound of pulverized alum.

Be sure to rub the mixture into every inch of the surface. Fold with the flesh side together and keep in a cool place for two weeks. Wash thoroughly with wool soap and soft water until wool is clean and white. Rinse

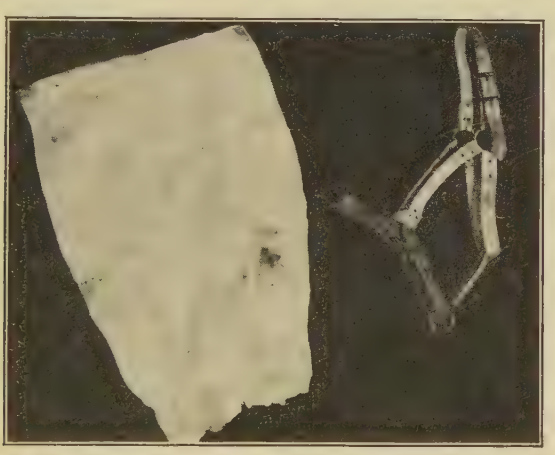


FIG. 120.—A part of a beef hide tanned for leather and halter made from same kind of leather. The harness-maker charged fifty cents to make this halter, which is almost unbreakable.

well, and stretch on a frame or old door and work with your hands or a blunt instrument while drying. The working will soften the skin. Finish dressing the skin with fine sandpaper or pumice stone.

Sheep Pelts.—Formerly the pelts were not considered, in buying the live animal, except to get light pelts in order to increase the dressing percentage. The pelts were all contracted to the wool pullery either of the

same firm or some other firm. A majority of the sheep buyers at the present time consider the pelt a valuable part of the offal. The value of the pelt has a great influence on the value of the sheep to the packer.

Fig. 121.—Showing method of working a tanned sheep pelt.

The value of the pelt depends upon, (1), the size of the pelt; (2), weight of fleece; (3), quality of fleece or fineness of the fiber (breeding and type have a great influence on the quality); (4), grade of wool; (5), clearness of fleece; (6), amount of grease; (7), color of wool; (8), soundness of fiber; (9), thickness of skin; (10), length of staple.

Pelts having a growth of three-fourths of an inch or more of wool are handled through the wool pulleries. If the fiber is less than three-quarters of an inch in length, the hide is tanned with the wool on.

CHAPTER XVI

METHODS OF TEACHING THE MEAT COURSE

The meat course is valuable for any one interested in livestock. You not only learn how to prepare your own meat, but are helped in the selection and judging of any kind of livestock. You soon learn to tell what is under the hide without slaughtering the animal. It is not only interesting from the standpoint of judging, but it shows the student the best type of animal for the production of meat.

After studying a course of this kind, students are able to buy meats intelligently. It is surprising to learn how little the average consumer knows about the selection and buying of meats.

There are several methods of teaching the meat course, all of which are interesting and instructive, but some are much better than others.

Lecture Methods.—The lecture alone is not a successful way to present the meat work. A student may take complete notes, be able to sketch the carcasses and name the cuts, and even be able to recognize the pictures of the cuts, and yet know very little about making or recognizing the cut itself. Sketches, charts, and photographs should be used quite extensively in this method.

Lecture and Demonstration Method.—This is considerably better than the lecture method alone, but not entirely satisfactory. With this method the student has an opportunity to see the actual slaughtering of the

animals and the cutting of the carcass. He notes the actual weights, dressing per cent, and shrink in cooling. He also has an opportunity to note the type, form, quality, and condition of the animal before slaughter, and he can then see the sort of a carcass and the kind of cuts that are obtained from the given type of animal. This will make him a better judge of livestock, for he will learn to tell what kind of a carcass an animal will produce without slaughtering. This is a great help in judging livestock. The great objection to the lecture and demonstration alone is that the student does not get the actual practice which is absolutely necessary if he expects to prepare his own meat on the farm, or to buy intelligently from the meat market. A student soon forgets how to make a certain cut and what the characteristics of the different cuts are.

Another objection to this method is that the demonstration quite often develops into an entertainment for the student. He, of course, is curious to see and hear, and quite often fails to take adequate notes.

Lecture, Demonstration, and Practice.—This method has been found to be the most successful. A certain amount of equipment is necessary. Each student should be assigned a knife. One saw, steel, and oil stone will be sufficient for about five students. Each student should be required to keep his knife sharp at all times. A slaughtering room should be provided because the weather too often interferes if the slaughtering is done outside. A refrigerator is another very essential part of the equipment. The carcass should be allowed to hang from one class period to the next; and, if you depend on the weather, the carcass is apt to either freeze or get too warm. Cutting benches or blocks, scales, curing barrels, and curing agents are also important.

Twenty-five students make a convenient-sized class. The students should be given their instructions during the lecture. The animals to be killed should be studied by the students first. The following table (*see* p. 228) should be filled out by the student and the cards turned in to the instructor, to be returned to the student at the beginning of the period for cutting the carcasses.

Fig. 122.—Teaching a class in Farm Meats at Iowa State College.

The class should then be divided into squads. For hogs, a squad of five men can work to a fair advantage on one 250-pound hog. Two students would be better, but class periods are usually only about three hours long. With only one barrel or vat for scalding, it would require too much waiting, and there would not be time enough to complete the work in a satisfactory way. More hogs than this make the lard rendering a long-drawn out process. For lambs, two students should work on one 90-pound lamb. For beef, six or eight men can work to good advantage on one 700-pound beef.

IOWA STATE COLLEGE

DEPARTMENT OF ANIMAL HUSBANDRY

Meat Laboratory

Placing Card

Placing on foot						
Live weight						
Warm dressed weight						
Dressing, per cent						
Weight of hide or pelt						
Placing dressed carcass						

Name ..... Date .....

The medium weight animals are always best for class room work: they are easier to handle and easier to dispose of after the class is through with the meat.

One man in each squad should be assigned a killing sheet as follows:

IOWA STATE COLLEGE

DEPARTMENT OF ANIMAL HUSBANDRY

Meat Laboratory

Hog Killing Record

Date .....Hog No. .....
Live weight when purchased .....Wt. after 24 hrs. shrink ....
Pounds shrink .....Per cent shrink .....
Cost per pound .....Total cost .....
Purchased from .....Date purchased .....
Market class ..... Grade .....Top of Chicago market on
Feed last sixty days ..... date purchased .....
Breed .....Age .....
Sex .....Color .....
Wt. of head ..... Wt. of Brain .....Type .....
Wt. of liver ..... Wt. Tongue .....Raised litter .....
Wt. of heart .....Caul fat .... ruffle fat ....
Warm dressing weight .....Warm dressing % .....
"Grade": prime, choice, good, medium, fair, common, inferior.
"Type": large, medium, small.
Remarks: .....

POST-MORTEM INSPECTION

Disease or lesion .....
Extent or parts involved .....
.....
Judgment .....
Miscellaneous lesions .....
Signed: Dr. .....
Inspector

IOWA STATE COLLEGE

DEPARTMENT OF ANIMAL HUSBANDRY

Meat Laboratory

Beef Killing Record

Date .....Beef No. .....
Live weight when purchased .....Wt. after 24 hrs. shrink ....
Pounds shrink .....Percent shrink .....
Cost per cwt. .....Total cost .....
Purchased from .....Date purchased .....
Market class .....Top of Chicago market on
Grade ..... date purchased .....
Feed last sixty days .....Age .....
Breed .....Color .....
Sex .....Wt. of liver .....
Wt. of head ..... Wt. Brain .....Wt. caul fat ...ruffle fat ...
Wt. of tongue .....Wt. of heart .....
Warm dressed weight .....Warm dressing % .....
Weight of green hide .....Percent of live wt. .....
"Grade": prime, choice, good, medium, common, cutter, canner.
Remarks: .....

POST-MORTEM INSPECTION

Disease or lesion .....
Extent or parts involved .....
.....
Judgment .....
Miscellaneous lesions .....
.....

Signed: Dr. .....
Inspector

IOWA STATE COLLEGE

DEPARTMENT OF ANIMAL HUSBANDRY

Meat Laboratory

Sheep Killing Record

Date .....Sheep No. .....
Live weight when purchased .....Wt. after 24 hrs. shrink ....
Pounds shrink .....Percent shrink .....
Cost per pound .....Total cost .....
Purchased from .....Date purchased .....
Market class .....Top of Chicago market on
Feed last sixty days ..... date purchased .....
Breed .....Age .....
Sex .....Weight of heart .....
Wt. of liver .....Weight of tongue .....
Wt. of head ..... Wt. Brain .....Wt. caul fat... Wt. ruffle ...
Warm dressed weight .....Warm dressing % .....
Weight of pelt .....Percent of live wt. .....
"Grade": prime, choice, good, medium, fair, common, inferior.
Remarks: .....

POST-MORTEM INSPECTION

Disease or lesion .....
Extent or parts involved .....
.....
Judgment .....
Miscellaneous lesions .....
.....
Signed: Dr. .....
Inspector

The instructor should explain to the class at this time just how the animal should be killed and bled. For student work it is best to stick the hogs and sheep alive, and the beef cattle should be stunned with a killing hammer or sledge. Never use a gun around a class of students. Part of the squad should hold the lamb or hog, and the instructor should take hold of the student's hand and guide the knife during the sticking process. After the animal is dead, each student should stick the animal again in order to get acquainted with the feel of the knife when sticking. This practice sticking gives the student a great deal of confidence for the next class period for killing. The beef cattle should be securely fastened to a post or tree before the student tries to stun them. Another student should be ready to stick the animal. In case the beef tries to get up after it is down, some other members of the squad should hold it down by pulling the tail forward between the hind legs and holding the hind feet from getting a foothold. The beef gets up behind first.

After the animal is dead, the instructor should demonstrate the next operation, and then have the students try it themselves. For instance, the instructor should drop a beef shank, skin part of the head, and open the brisket and abdominal cavity the first day. After the first killing period, the instructor should make certain that the student is doing the work in the proper way. All weights should be taken and dressing percentage computed.

At the next meeting of the class, the placing cards should be returned.

The students who killed the animals should make the cuts on them. Another student in the squad should be assigned a cutting sheet as follows:

IOWA STATE COLLEGE

DEPARTMENT OF ANIMAL HUSBANDRY

Meat Laboratory

Pork Cutting Record

Date .....Date Slaughtered .....Hog No. .....
Live weight when purchased .....
Live weight after 24 hrs. shrink .....
Warm Dressed Weight .....Warm Dressing % .....
Cold Dressed Weight .....Cold Dressing % .....
Percent shrink while in cooler .....

	Right	*Left*	*Total*	*Per cent of live wt. after 24 hrs. shrink*
Weight of side	.....	.....	.....	.....
Wt. of ham untrimmed	.....	.....	.....	.....
Wt. of ham trimmed	G S	G S	.....	.....
Wt. of shoulder untrimmed	.....	.....	.....	.....
Wt of picnic shoulder trimmed ...	G S	G S	.....	.....
Wt. of Boston Butt Trimmed	.....	.....	.....	.....
Wt. of jowl untrimmed	.....	.....	.....	.....
Wt. of jowl trimmed	G S	G S	.....	.....
Wt. of middle piece	.....	.....	.....	.....
Wt. of back	.....	.....	.....	.....
Wt. of loin	.....	.....	.....	.....
Wt. of fat back	.....	.....	.....	.....
Wt. of belly	.....	.....	.....	.....
Wt. of bacon	G S	G S	.....	.....
Wt. of spare ribs	.....	.....	.....	.....
Wt. of sausage meat	.....	.....	.....	.....
Wt. of leaf fat	.....	.....	.....	.....
Wt. of total fat used for lard	.....	.....	.....	.....
Wt. of rendered lard	.....	.....	.....	.....

G—Green. S—Smoked.

IOWA STATE COLLEGE

DEPARTMENT OF ANIMAL HUSBANDRY

Meat Laboratory

Beef Cutting Record

Date .....Date Slaughtered ....Beef No. .....
Live weight when purchased .....
Live weight after 24 hrs. shrink .....
Warm dressed weight .....
Warm dressing % .....
Cold dressed weight .....Cold dressing % .....
Percent shrink while in cooler .....

	Right	*Left*	*Total*	*Per cent of live wt. after 24 hrs. shrink*
Weight of side	.....	.....	.....	.....
Wt. of fore quarter	.....	.....	.....	.....
Wt. of shank	.....	.....	.....	.....
Wt. of chuck	.....	.....	.....	.....
Wt. of rib	.....	.....	.....	.....
Wt. of brisket	.....	.....	.....	.....
Wt. of navel end	.....	.....	.....	.....
Total wt. of plate	.....	.....	.....	.....
Wt. of hind quarter	.....	.....	.....	.....
Wt. of suet and kidney	.....	.....	.....	.....
Wt. of flank	.....	.....	.....	.....
Wt. of flank steak	.....	.....	.....	.....
Wt. of loin	.....	.....	.....	.....
Wt. of short loin	.....	.....	.....	.....
Wt. of loin end	.....	.....	.....	.....
Wt. of rump	.....	.....	.....	.....
Wt. of round, shank on	.....	.....	.....	.....

IOWA STATE COLLEGE

DEPARTMENT OF ANIMAL HUSBANDRY

Meat Laboratory

Lamb and Mutton Cutting Record

Date .....Date Slaughtered .....Sheep No. .....
Live weight when purchased .....
Live weight after 24 hrs. shrink .....
Warm dressed weight .....
Warm dressing % .....
Cold dressed weight .....Cold dressing % .....
Percent shrink while in cooler .....

	Right	*Left*	*Total*	*Per cent of live wt. after 24 hrs. shrink*
Weight of side	.....	.....	.....	.....
Wt. of saddle	.....	.....	.....	.....
Wt. of rack	.....	.....	.....	.....
Wt. of leg of mutton	.....	.....	.....	.....
Wt. of loin	.....	.....	.....	.....
Wt. of short rack	.....	.....	.....	.....
Wt. of shoulder	.....	.....	.....	.....
Wt. of shoulder boned and rolled .	.....	.....	.....	.....
Wt. of neck	.....	.....	.....	.....
Wt. of plate and flank or stew	.....	.....	.....	.....

Placing or Ranking Carcasses.—The class should compare the carcasses before any cutting is done. The instructor should then cut one-half of the carcass, and explain all the cuts to the class. The students should then mark the cuts and get the instructor's O.K. before making the cut. After the wholesale cuts are made, representative cuts should be lined up on a table or bench. For instance, the leg of lamb, the rib end of the loin, and the shoulder end of the short rack should all be lined up and compared. The class should then place the carcasses and compare their estimated dressing percentages with the actual figures. Several students should be called upon for their placings and reasons, emphasizing the difference, if any, between the on foot placing and the placing on the cuts. Sometimes the student will reverse his on foot placing when he sees the cuts.

After the cuts are all made, the squad should be asked to place the cuts back together again. They should also note the shape and size of the bones and muscles in the cuts.

After the cutting is done, the squads should be assigned certain work. For instance, each man should take care of his own knife, but one squad should clean up, another render lard, another make the sausage, and another cure the meat. The pork cuts can easily be kept separate in the cure by branding a number on the skin side. This is about the only satisfactory way of keeping the cuts separate, so that they can be identified after the meat is cured. Each squad should follow its cured meat through the smoke house and finish it up.

The class should always begin on pork so that the meat can be cured and finished by the same squad of students.

In order to learn about meats, the student should do

the actual work himself. Too many times on the farm the boys are allowed to carry water and keep the fire going, but are not allowed to stick and gut hogs, and trim hams and cure the meat. While it will help the student to watch work done by another, it will help him a great deal more to do the work himself under the proper supervision.

CHAPTER XVII

THE MEAT DEMONSTRATION

Meat demonstrations are becoming quite popular among farmers. Farmers of the present generation are taking more interest in the production and preparation of their own meat on the farm. Their fathers and grandfathers before them would cure their own meat and prepare a splendid product.

Meat demonstrations may be conducted in a great many different ways. They may develop into an entertainment or they may be made very instructive.

Methods.—Where a small group of farmers are gathered together, and are interested in learning how to kill, dress, and cut meat animals, and judge the carcasses and cuts, it is always best to allow each man to use a knife, and teach him how to sharpen it and how to keep it sharp. The average man will get very little out of a demonstration if he is allowed to sit back and look on. He will not feel so free to ask questions as he would if he had a hand in the operation. You can watch some one else handle the knife, but when you try it yourself it does not feel at all the way it looked. If the group is too large to let every one take a hand, then select about six or eight men, and have them try to stick the hog or beef, and then let the other men all profit by any mistakes made. Explanations should always be made as to why you make certain cuts as you do and what other methods there are, and why your way is the

best. Farmers often get splendid ideas from each other when they are all working together and feel free to ask questions. In this way each man could try to make the different cuts and then be shown exactly where his mistakes were made and just what should be done to correct them. Men will always learn by watching a man make mistakes similar to the ones that they would make, and then have some one explain their error and show them how it should be done. Men are usually more interested if the meat belongs either to themselves or to one of their neighbors. As the cuts are made, their use and relative value should be explained.

A meat demonstration may consist merely in one or two men doing all the work and explaining as they go. Great care should be taken to go slow and do the work so that the audience can see every operation. This method is not so satisfactory as the method where the men work together.

One very successful way, which is usually practiced by "Uncle" John Gosling, a noted meat expert from Kansas City, is carried out as follows:

Selection of Animals

A prime two-year-old steer.

A short-fed steer from one to two years old, fed about ninety days and weighing around one thousand or eleven hundred pounds.

A big, soft, gobby, overdone beef cow, the fatter the better.

A thin canner cow, the thinner the better.

A beef type calf about one week old.

A dairy type calf about one week old.

A yearling wether.

A fat lamb.

A bacon type hog.

A lard type hog.

The animals are examined, criticized, and commented upon on foot. The factors which influence dressing percentage should be discussed in detail. The prime two-year-old steers will usually show a full tongue root, a heavy brisket, a great expanse of flesh across the crops and top of the ribs, a neat hook, well covered straight top, bottom, and side lines. The loin will be wide and the hindquarters well filled out. In going over the short-fed steer, a comparison of the two steers may be made, showing where one will have almost, if not as much, lean as the other. It is also well, at this time, to explain the type of beef animal most in demand by the packers, dealers, and consumers. The fat cow should be gone over quite carefully and the wasty parts pointed out. The canner cow always attracts quite a little attention. The cuts should be pointed out and explained. She may look as though she does not have a pound of meat on her bones, but a surprise is in store when the shoulder clod is pulled. The Spencer roll, loin strip, boneless rump, and the dried beef set (which is made up of the inside, outside, and knuckle of the round) are usually quite a revelation to an audience. The tenderloin and the flank steak must not be forgotten. The two calves should be commented upon, and the difference in natural fleshing pointed out. This shows clearly the importance of emphasizing type in the breeding animals. Differences should also be noted in the lamb and wether. The parts indicating finish should be pointed out. The hogs should be commented upon and the differences in type and the different uses of the carcass explained.

In about three days the carcasses will have had a chance to cool out and the cuts can then be made in good

shape. At this time the canner is boned out and the cuts, values, and uses explained; the two steer carcasses and the cow carcass may be cut and comparisons of the various cuts in each may be made, pointing out the poverty of the canner and the superabundance of fat in the

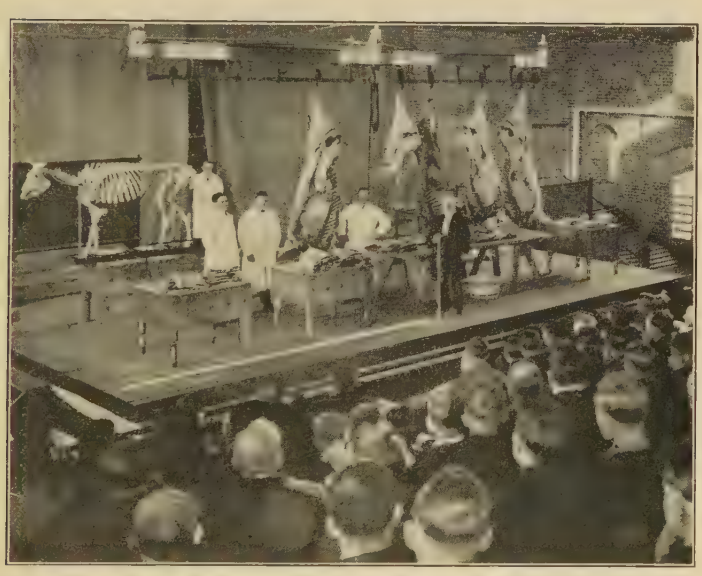


FIG. 123.—"Uncle" John Gosling, a noted meat expert from Kansas City, giving a meat demonstration during Farm and Home Week at Iowa State College. Louis Young, an expert meat cutter, is standing at Mr. Gosling's right.

fat cow and the relative amount in the fat steer. The demands of the consumer should be explained and commented upon.

The two calves, as shown in Fig. 43, present important differences. Compare the width across the back and the development of the round. Note the "shelly" shoulder and the refined neck of the dairy calf.

The lamb and yearling usually present quite a contrast, the lamb having just enough but plenty of fat, and the yearling presents a wasty carcass. The cuts should be made and explanations given to prove that the extra year in the yearling—which is virtually two years old—is made at a loss of time, feed, and money.

The bacon and hog carcasses are always interesting,

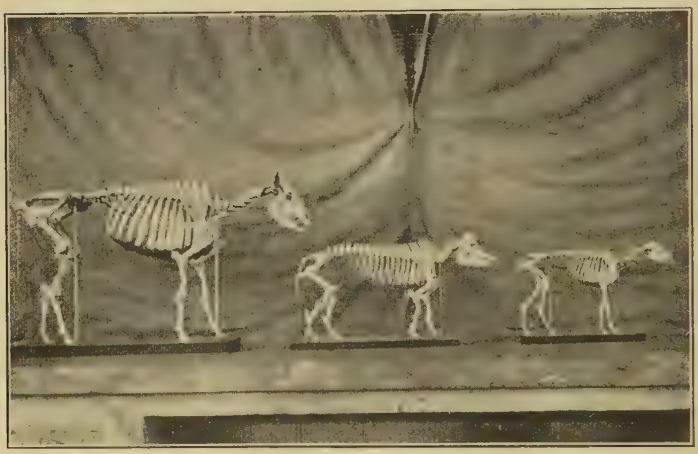


FIG. 124.—Beef, Hog, and Sheep skeletons. A most valuable part of any meat course or demonstration.

the one showing a high percentage of lard and the other the much desired streak of fat and streak of lean.

The skeletons of the beef, hog, and lamb are a very valuable addition in giving a demonstration of this kind.

Where your time is limited to about an hour and a half or two hours, and you want to explain about the carcasses of the different meat animals, the following method has proven very satisfactory:

Select the following carcasses:

A well finished beef carcass

A medium weight veal carcass
A handy weight hog carcass
Two lamb carcasses.

Make all of the cuts on the one side of beef and lay them on the table with a label on each cut. Mark out all of the cuts with a knife on the other side, and allow it to remain hanging and label each cut on the side

FIG. 125.—Ready for a meat demonstration at Iowa State College.

which is hanging, also. Do the same way with the veal and pork. One of the lamb carcasses should be cut up and the other one marked out and allowed to hang. Allow your audience about thirty minutes to examine the cuts on the tables and compare them with the marked carcasses. With the audience seated, the halves of the beef, hog, and sheep with the skeletons should be near. Have some one bring you the cuts from the tables. Explain the various cuts, showing their location on the carcass and also on the skeleton. Explain which cuts

are the most desirable and why the highest priced cuts are not always the most economical ones to buy.

The various charts prepared by the different packing companies are helpful in giving meat demonstrations.

It is quite surprising to find out how little the average consumers know about the meat they buy.

Meat demonstrations, where steers, hogs, or sheep of the same type and age, but of different condition, are used, are very instructive. Overfat animals always cut wasty and the lean meat is very expensive. Most people prefer the medium condition. Underfed or thin animals usually cut rather tough and stringy.

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APPENDIX

APPENDIX

I

REGULATIONS
for the
INSPECTION OF PROVISIONS

Adopted by the Board of Directors
May 31, 1921

Board of Trade, Chicago

Regulation 1. For the examination of provisions sold as Standard, it shall be the duty of any Inspector properly appointed by the Association, on receiving notice, to go to any packing house or warehouse in the city, to examine provisions, in such quantities as may be required, selecting the same in such a manner, from the lots specified, as, in his judgment, will give a fair sample of the whole.

Reg. 2. If, upon examination, the property is found, in all respects, up to the requirements of the classification of the grades adopted by the Association, he shall issue a certificate to that effect, which certificate shall state the number of packages, pieces, or pounds examined, and also the number of packages, pieces, or pounds in the lot to which the examination is intended to apply, and that the packages (if any) are in good merchantable order and condition. In the case of lard, no certificate for inspection shall be issued unless every package is examined; but on request of the owner or person ordering the inspection, the Inspector may examine a part of a lot, and issue a certificate of such examination, stating the number of packages examined, and also the whole number of packages in the lot.

Reg. 3. When necessary to remove property for the convenience of examination, it shall be the duty of the Inspector to send for the same, that a fair sample may be obtained. In no case should a certificate be granted on samples delivered by the seller.

Reg. 4. The fees for inspection are established as follows: For inspection by sampling—including repacking and coopering—Beef and Pork, for the first five barrels, one dollar ($1.00) per barrel, and for each additional barrel, twenty-five (25) cents. For inspecting S. P. Meats, for the first five tierces, one (1) dollar per tierce, and for each additional tierce, twenty-five (25) cents. For inspecting boxed Meats, for the first five boxes, one (1) dollar per box, and for each additional box, fifty (50) cents. When the whole of a lot is inspected—labor and coopering to be furnished by the seller—for Beef and Pork, ten (10) cents per barrel. For S. P. Meats, in lots of fifty (50) tierces or more, twelve and a half (12½) cents per tierce; in lots of one hundred (100) tierces or more, ten (10) cents per tierce. For bulk or boxed dry salted Meats, in carload lots or more, seventeen and one-half (17½) cents per one thousand (1,000) pounds. For Lard in lots of one hundred (100) tierces or more, five (5) cents per tierce. For Tallow and Grease, six (6) cents per tierce. For bulk or boxed Sweet Pickled Meats, thirty-three and one third (33⅓) cents per one thousand (1,000) pounds.

Tallow and Grease.—Weighing.

The fees for weighing are established as follows: Lard and Grease five (5) cents per package.

Tallow in half hogsheads, or small packages, five (5) cents per package; in hogsheads, ten (10) cents each.

Stripping.

Bulk or box Meats, not including labor, twelve and one-half (12½) cents per one thousand (1,000) pounds.

Breaking Down and Repiling.

For stripping Lard, Grease and Tallow, fifty (50) cents per package.

The fees for stripping and for weighing of property of any kind shall be divided equally between the buyer and seller.

For inspecting or for weighing lard, oil, etc., in tanks, the rate shall be $3.50 per tank.

Repacked Provisions.—Branding.

Reg. 5. It shall be the duty of the Inspector, when requested by the owner, either at any packing-house, warehouse, or in yards provided by the Inspector, to overhaul and inspect provisions, according to the qualifications and classifications authorized; two hundred pounds of meat, with abundance of good salt, to be repacked into each barrel, and cooperage to be put in good order; each barrel of provisions that is sound, sweet, and free from any and every defect, to have grade and date of inspection branded thereon, and the word "Repacked," as hereinafter specified; and any portion that is defective to be branded, in like manner, "Rusty," "Sour," or "Tainted," as the case may be; the said brand to be placed with the Inspector's brand across the regular packer's brand; such provisions, according to the grade or quality, to be classed as "Repacked 200 lbs."

Branding Implements.

Reg. 6. The Inspector shall use metallic letters and figures marking iron, or stencil for their dates and class of inspection.

Branding.

Reg. 7. It shall also be the duty of the Inspector to put his metallic brand, marking iron, or stencil on all samples of provisions in tierces or barrels that he inspects; and he shall pass no hog products in tierces or barrels as Standard, unless the real packer's name, location, number of pieces, date, and weight of the products contained therein are branded, according to these Rules, on the head of every package.

Pickled Meats, Irregularly Packed.

Reg. 8. Should the Inspector be called upon to inspect pickled meats, and upon examination he should be of the opinion that the number of pounds required by these Rules

had not been originally packed, he shall not pass them as Standard, but shall refer the matter at once to the Committee on Provision Inspection, who shall investigate, and if a satisfactory explanation can be given or arrived at, they shall instruct the Inspector to proceed and inspect and pass them; but if not satisfactory to the Committee, they shall, in their judgment, make the fact known to the Association in any way they may think most proper.

Uniformity of Contents.

Reg. 9. Contents of each package of pickled meats must show a reasonable uniformity in weight according to its class.

Visitation of Packing Houses.

Reg. 10. It shall be the further duty of the Inspectors during the packing season to visit frequently the different packing-houses to see that provisions are properly dated and branded at time of being packed.

Cut of Sides May be Changed.

Reg. 11. Dry salted and sweet pickled meats may be made into other cuts, and if, in all other respects, they comply with requirements, they shall be classed as Standard.

Technicalities.

Reg. 12. All the foregoing regulations, and the requirements as to the cutting and packing of hog products, must be justly and liberally construed, and no property shall be rejected or condemned on mere technicalities; but this shall not be regarded as giving license to departure from their general spirit and intent; nor shall they be construed as in any way changing special terms at time of purchase and sale.

Rebulking.

Reg. 13. It is understood that the warehouseman has the right to rebulk dry salted meats after the expiration of the five day free storage period, and as often thereafter as is necessary, upon notice to the owner. In the event that the

owner cannot be located, the Provision Inspector shall decide whether it is necessary or not.

The following rates effective January 1, 1919:

STORAGE RATES

Mess Pork, per bbl. ..... 8 cents each ten days
P. S. Lard, per tce. ..... 10 cents each ten days
D. S. Short Ribs, per 100 lbs. ..... 4 cents each ten days

LOADING CHARGES

Mess Pork, per bbl. ..... 7 cents
P. S. Lard, per tce. ..... 10 cents
D. S. Short Ribs, per 1000 lbs. ..... 25 cents
Repiling P. S. Lard, per tce. ..... 10 cents
Bulking D. S. Short Ribs, per 100 lbs. ..... 12 cents

II

REQUIREMENTS
as to the
CUTTING AND PACKING OF HOG PRODUCTS

Adopted by the Board of Directors
Board of Trade, Chicago

Barreled Pork.

MESS PORK.

Standard.—Standard mess pork should be made from sides of well-fatted hogs, split through the center, cut into strips of reasonably uniform width, properly flanked and not backstrapped.

Between October 1 and the last day of February, inclusive, one hundred and ninety (190) pounds, and between March 1st and September 30th, inclusive, one hundred and ninety-three (193) pounds of green meat, numbering not over sixteen (16) pieces, including the regular proportion of flank and shoulder cuts, placed four layers on edge without excessive crowding or bruising, shall be packed in each barrel, with not less than forty (40) pounds of coarse salt, and barrel filled with brine of full strength; or forty (40) pounds of coarse salt, and, in addition thereto, fifteen (15) pounds of salt, and barrel filled with cold water.

BACK PORK.

Requirements.—Back pork should be made from the backs of well-fatted hogs, after bellies have been taken off, cut into pieces of about six (6) inches in width, and in all other re-

specfs to be cut, selected and packed in the same manner as mess pork.

Extra Clear Pork.

Requirements.—Extra clear pork should be made from the sides of extra heavy, well-fatted hogs, the backbone and ribs to be taken out, and in all other respects to be cut, selected and packed in the same manner as mess pork.

Clear Pork.

Requirements.—Clear pork should be made from the sides of extra heavy, well-fatted hogs, the backbone and half the rib next the backbone to be taken out, and in all other respects to be cut, selected and packed in the same manner as mess pork.

Clear Back Pork.

Requirements.—Clear back pork should be made from the backs of heavy, well-fatted hogs, after bellies have been taken off, and backbone and ribs taken out, cut into pieces of about six (6) inches in width, and in all other respects to be packed in the same manner as mess pork.

Fat Back Pork.

Requirements.—Shall be made from well fatted hogs, after the loin, blade bone and belly have been removed, cut into about six (6) inch pieces of uniform thickness, packed on edge, and placed in four (4) layers. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment, two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Ham Butt Pork.

Shall be made of pieces cut from the rump end of the side in squaring, after a short ham has been removed; somewhat of a triangular piece in shape. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment, two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Bean Pork.

Shall be made from the jowl, neatly trimmed on the face, and cut into square pieces. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Jowl Pork.

Shall be made from the jowl, trimmed on the face and edges, blood clots and loose pieces removed, and the side next to the shoulder squared. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Clear Plate Pork.

Shall be made from the fat end of the shoulder, free of bone, reasonably free of lean, and squared on the neck side. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Plate Pork.

Shall be made from the fat end of the shoulder, part of the blade bone left on, reasonably free of lean, and squared on the neck side. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Shoulder Butt Pork.

Shall be made from the butt end of the shoulder, after the picnic is cut off, the neck bone and part of the blade left in, neck squared, and the flaring fat at the butt end squared off. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of

shipment two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Clear Shoulder Butt Pork.

Shall be made the same as shoulder butt pork, except that the neck bone shall be removed. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Loin Pork.

Shall be made from loins, tenderloin out, cut into two, three or four pieces, and packed on edge without excessive crowding. The barrel to be filled with full strength pickle, and at least thirty (30) pounds of coarse salt, and shall weigh at time of shipment two hundred and four (204) pounds net, or two hundred and six (206) pounds out of pickle.

Green or Sweet Pickled Meats.

Standard Hams.

Shall be cut off about two and one-half (2½) inches from the exposed end of the aitch bone, properly faced, shank cut off in or above the hock joint, loose and gut fat removed from the face, and the ham well rounded.

Skinned Hams.

Shall be cut, in all respects, the same as standard hams, except that the skin must be removed down to within, at most, four (4) inches from the shank, the fat to be beveled back at least three (3) inches from the lean at the butt, and to be neatly rounded and beveled on flank and cushion, not over one and one-quarter (1¼) inches of fat to be left on any portion of the ham from which the skin has been removed.

Standard Picnics.

Shall be made from the shoulder, after the butt has been cut off, to leave not less than one (1) inch, nor more than

two and one-half (2½) inches of blade bone in the picnic. The shank cut off in or above the knee joint, breast flap, loose fat or lean removed, trimmed full, and the fat beveled on the butt end, which must be well rounded.

New York Shoulders.

Shall be made from smooth hogs, shank cut off one (1) inch above the knee joint, butted about one (1) inch from the blade bone, neck bone and breast flap taken off, neck removed and trimmed close.

Rib Bellies.

Shall be made from nice smooth sides, after the back has been removed, reasonably square cut and trim, and the breast bone removed. No scribed cut bellies shall be classed as standard.

Clear Bellies.

Shall be made from nice smooth sides, after the back has been removed, reasonably square cut and trim, and free of bone. No scribed cut bellies shall be classed as standard.

Clear Bellies—Square Cut and Seedless.

Shall be made from nice smooth sides of barrow hogs, after the back has been removed. Sows will be acceptable, provided that they are cut down, until the seed, if any, is removed. To be free of bone, and trimmed square on all edges. No scribed cut, extremely long and narrow, or wide and short belly, will be classed as standard.

Branding.

The packer's name, location, number of pieces, and date of packing, shall be branded on the head of each package of pickled meats, at time of packing. Also, on each package of lard shall be branded the month and year of packing such lard.

Uniformity of Pickled Meats.

All pickled meats shall be sized when packed, the light, medium and heavy separately, as nearly as practicable.

Dry Salt Meats.

Short Rib Sides.

Shall be made by splitting the hog through the back bone. The ham, shoulder and loose lard or fat to be taken off. The feather of the blade bone should not be removed, and no incision (pocket) shall be made in the side.

Extra Short Clear Sides.

Shall be cut reasonably square at each end, the loin and spare ribs to be removed, the breast bone cut out, or sawed down level with the face of the side. The blade bone may be left in, or removed.

Extra Short Rib Sides.

Shall be made the same as extra short clear sides, except, that the spare ribs and breast bone shall be left in.

Short Clear Sides.

Shall be reasonably square at each end, the back bone and spare ribs to be taken out, hench bone and breast bone sawed down smooth and even with the face of the side.

Long Clear Sides.

Shall be cut reasonably square at the tail and shoulder ends, the neck taken off and smoothly trimmed, the back bone, ribs, blade bone, shoulder bones, and leg bone removed, hench bone and breast bone sawed off or cut down level with the face of the side.

Short Clear Backs.

Shall be made from the sides of smooth hogs, from which the bellies have been cut, back bone and ribs taken out, and the lean left on, tail bone sawed off even with the face of the meat, trimmed smooth, and reasonably squared on all edges.

Rib Backs.

Shall be made the same as short clear backs, except that the spare ribs shall be left in.

Rough Backs.

Shall be made from short rib sides, from which the bellies have been removed; all bones left in.

Rib Bellies.

Shall be made from the side, after the back has been removed, reasonably square cut, and trimmed on all sides. Ribs and breast bone left in, and free of loose fat. No scribed cut bellies shall be classed as standard.

Clear Bellies.

Shall be made from the side, after the back has been removed, reasonably square cut, and trimmed on all sides, and to be free of bone and loose fat. No scribed cut bellies shall be classed as standard.

English Bellies.

Shall be made from nice smooth sides of barrow hogs, after the back has been removed. Sows may be used however, provided the seed is cut out, and the width of the belly is in proportion to its length. All edges shall be trimmed square and all bones removed. No scribed cut bellies shall be classed as standard.

Note.—Barrow bellies are preferable.

Short Fat Backs.

Shall be made from the sides of well fatted hogs, from which the bellies and loins have been removed. Blade bone cut off, and practically free of lean. All edges to be reasonably squared, with the exception of the tail end, which shall be squared sufficiently to leave not more than a two (2) inch bevel on the corner. The width and thickness of the back shall be reasonably uniform its entire length.

Regular Shoulders.

Shall be cut fairly close to the back part of the forearm joint, fat end butted, neck bone and ribs taken out, neck squared, breast flap trimmed off, and foot to be cut off in, or above, the knee joint.

New Orleans Shoulders.

Shall be made the same as D. S. regular shoulders, except that they must be cut from one (1) inch to two (2) inches narrower, part of the neck left on, and the leg cut off below the knee joint.

Regular Plates

Shall be made from the fat end of the shoulder, with part of the blade bone left in, and the neck side squared.

Clear Plates.

Shall be made from the fat end of the shoulder, with the blade bone removed and the neck side squared.

Jowl Butts.

Shall be made from the jowl, slightly faced, and the loose pieces cut off.

Wiltshire Sides.

Shall be made from nice smooth selected hogs. The shoulder, side, and ham left together in one piece. The foreleg to be cut off at, or above the knee joint, and the hind leg at, or above, the hock joint. The shoulder ribs, neck bone, back bone, aitch bone, skirt and loose fat to be removed. The breast bone to be sawed, or cut down, even with the face of the side. Neatly trimmed on the belly, and squared on the neck.

Cumberland Sides.

Shall be made from nice smooth selected hogs, after the ham has been taken off. The leg cut off in, or above, the knee joint. The shoulder ribs, neck bone, back bone, skirt and loose fat removed. The breast bone sawed, or cut down, smooth and even with the face of the side. Neatly trimmed on the belly, and squared on the ham and neck ends.

Dublin Middles.

Shall be made from smooth light hogs. The side must be thin; made the same as Cumberlands, except that the leg shall be cut off close to the breast.

Long Rib Sides.

Shall be taken from smooth light hogs, made the same as Cumberlands, except that the blade bone must be removed, and the leg cut off close to the breast.

Birmingham Sides.

Shall have the back bone, ribs and blade bone removed, pocket piece cut out and pocket nicely rounded, knuckle bone left in, and leg cut off close to the breast.

South Staffordshire Sides.

Shall be made the same as Birmingham, except loin taken out full to top of shoulder blade, leaving only a thin strip of lean along the back; knuckle left in, and leg cut off close to the breast.

Yorkshire Sides.

Shall be made the same as Cumberlands, with ribs out.

Irish Cut Sides.

Shall be made the same as long clears, with the knuckle bone left in.

English Short Clear Backs.

Shall be made from the sides of smooth hogs, from which the bellies have been removed, squared on all edges, lean left on, and free from bone.

English Rib Backs.

Shall be made the same as English short clear backs, except that the spare ribs shall be left in.

Long Cut Hams.

Shall be cut from the side by separating with a knife, the hip bone from the rump. Properly rounded out, and foot taken off at, or above, the hock joint. The ham shall not be faced.

Square Shoulders.

Shall be made from nice smooth hogs, and cut fully three (3) ribs wide through the gristle of the blade bone. The neck bone, breast flap and ribs shall be removed, foot cut off, at or above, the knee joint, and squared on the neck and butt.

South Staffordshire Hams.

Shall be cut short, hip bone taken out at socket joint, hock unjointed at first joint below the hock joint.

Manchester Hams.

Shall be made in all respects like the South Staffordshire hams, except that the hip bone must be left in.

Backstrapping.

Backstrapping of side meats is not permissible.

Uniformity of Boxed Meats.

In packing meats in boxes, the pieces shall be uniform in average, as nearly as practicable, in packages made to suit the different sizes.

Green Meats.

In the sale of green meats, it is understood that "chilled" weights shall be delivered.

On sales of green hams, it is understood that hams, from which the lean ones have been taken, will not be considered a fair tender.

Range of Green, Sweet Pickled, and Dry Salt Meats

No piece lighter than	*Average*	*No piece heavier than*	*No piece lighter than*	*Average*	*No piece heavier than*
3	4	5	18	23	28
4	5	6	19	24	29
5	6	7	20	25	30
6	7	8	21	26	31
6	8	10	22	27	32
7	9	11	23	28	33
8	10	12	24	29	34

No piece lighter than	*Average*	*No piece heavier than*	*No piece lighter than*	*Average*	*No piece heavier than*
9	11	13	25	30	35
9	12	15	25	31	37
10	13	16	26	32	38
11	14	17	27	33	39
11	15	19	27	34	41
12	16	20	28	35	42
13	17	21	29	36	43
14	18	22	29	37	45
15	19	23	30	38	46
16	20	24	31	39	47
16	21	26	32	40	48
17	22	27	33	41	49

It is understood that the above range is the limit from the actual average of the lot delivered.

Lard.

Regular Prime Steam Lard.

Standard prime steam lard shall be solely the product of the trimmings and other fat parts of hogs, rendered in tanks by the direct application of steam, and without subsequent change in grain or character by the use of agitators or other machinery, except as such change may unavoidably come from transportation. It must have proper color, flavor and soundness for keeping, and no material which has been salted must be included. The name and location of the renderer, the month and year of filling, and the grade of the lard shall be plainly branded on each package at time of filling. Each tierce shall be properly filled.

Prime steam lard of superior quality as to color, flavor and body may be inspected as "Prime Steam Lard, Choice Quality" and shall also be deliverable on contracts for "Prime Steam Lard."

Cash Lard.

Cash lard in tierces, and loose lard as to quality, shall comply in all respects to the requirements of regular prime steam lard, unless otherwise specified at time of purchase and sale.

TIME OF SHIPMENT, SELLER'S OPTION

IMMEDIATE ..... Three business days after the day of sale.

QUICK ..... Five business days after the day of sale.

PROMPT ..... Ten business days after the day of sale.

WITHIN A WEEK ..... Seven calendar days after the day of sale.

FIRST WEEK OF THE MONTH .... First seven calendar days of the month.

SECOND WEEK OF THE MONTH .. From the eighth to the fourteenth, inclusive.

THIRD WEEK OF THE MONTH .... From the fifteenth to the twenty-first, inclusive.

LAST WEEK OF THE MONTH ..... Last seven calendar days of the month.

FIRST HALF OF THE MONTH ..... From the first to the fifteenth, inclusive, except February, which shall be to the fourteenth, inclusive.

LAST HALF OF THE MONTH ..... From the sixteenth to the last day of the month, inclusive, except February, which shall be from the fifteenth to the last day of the month, inclusive.

SHIPPING TERMS OF PURCHASE AND SALE

F. O. B.—Free on board.

C. A. F.—Seller furnishes car and pays or allows transportation charges to original C. A. F. destination. Buyer assumes all responsibility after car is loaded and bill of lading secured.

CHICAGO FREIGHT.—Should place buyer and seller in same position, as to freight, as if goods were sold to be shipped from Chicago.

F. A. S.—Free alongside steamer. Sellers obligation to deliver the goods within reach of the ships' tackle.

Packages.

Barrels.

Pork barrels shall be made of well seasoned white, red or burr oak, white ash or birch, and may be coated on the inside with refined paraffine wax, or other substance acceptable to the United States Department of Agriculture, a sufficient quantity only to be used to fill up the pores of the wood for the purpose of preventing soakage and leakage.

Staves should be about ⅝ inch thick, 29 or 30 inches long; head about 18 inches, and the head about ⅝ inch thick in center. Six galvanized iron hoops to be used, three on each end, as follows:

Head Hoops	1½ in. x 19 gauge.
Quarter Hoops	1¼ in. x 19 gauge.
Bilge Hoops	1½ in. x 19 gauge.

Wood-bound barrels shall be hooped not less than eleven-sixteenths (11-16) of the surface, with hickory or white oak.

Lard Tierces.

Lard tierces shall be made of well seasoned white, red or burr oak or white ash, and may be coated on the inside with Silicate of Soda, or other substance acceptable to the United States Department of Agriculture, a sufficient quantity only to be used to fill up the pores of the wood for the purpose of preventing soakage and leakage. Staves should be about 34 inches long with a head about 20½ inches, or about 33 inches long with a head about 21 inches. The tierces should contain not less than 360 pounds net, nor more than 392 pounds net. Staves to be chamferred at the head and about ¾ inch thick, head about ¾ inch thick in center and ⅜ inch at bevel. At least six iron hoops to be used, three on each end 1¾, 1½ and 1¾ for head, quarter and bilge.

Head Hoops	1¾ in. x 18 gauge.
Quarter Hoops	1½ in. x 19 gauge.
Bilge Hoops	1¾ in. x 19 gauge.

Wood-bound tierces shall be hooped not less than eleven-sixteenths (11-16) of the surface, with hickory or white oak.

Tierces for Pickled Meats.

Tierces for pickled meats shall be made of well-seasoned white, red or burr oak, white ash or birch, and may be coated on the inside with refined paraffine wax, or other substance acceptable to the United States Department of Agriculture and suitable for use in the packing of pickled meats. In other respects the same specifications as for lard tierces.

Boxes.

Shall be made of good sound lumber, dressed on both sides to a thickness of not less than 13-16 of an inch. To have good strong hardwood, white wood, or pine cleats outside, nailed and clinched to the top, bottom and sides of each end. Straps to be of iron or steel, about ⅞ of an inch in width, to overlap about six inches on the side of the box, and nailed with tenpenny nails.

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